ELF Update: Macworld Lab Tests Monitors

MACWORLD

The Macintosh®Magazine

October 1991

\$3.95

Canada \$4.95

Desktop Publishing Tools

COLOR MONITORS

28 Products Tested

MW LAB

How Good Is Your

MAC TYPOGRAPHY



57069-2307 #2F10 #AFF AEKWIFTION SD MIN OE S DEKOLE DON LICKNOK

#ICKO¢1¢C002 2#670264 003

SCANNERS

13 Products Tested

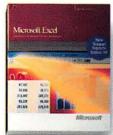
MW LAB

All About

COLOR PREPRESS



New Microsoft Excel of an exhaustive cor



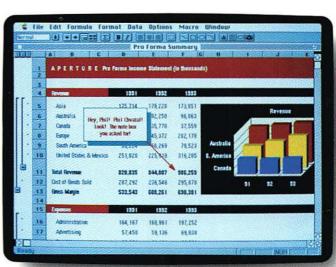
Betsy Mill put it all in perspective when she wrote to us, "I love [Microsoft] Excel as much as my microwave oven but no love is perfect."

Well, Betsy, get a load of this. We think new Microsoft Excel version 3.0 is the closest thing to perfection ever seen in a spreadsheet for the Mac. For one good reason.

Power made easy.

The new Toolbar, for instance, reduces common, time-consuming tasks down to one step.

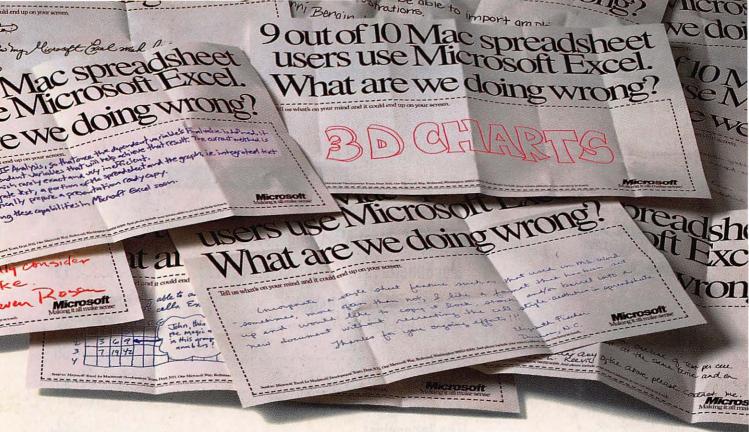
Highlight a row or column of numbers, hit the Σ button (that's Autosum'),



Yes, Paul, a single button now lets you access 68 chart types, 24 of which are 3-D. You can incorporate these right into your worksheet, along with text and data. And notice the outlining feature on the left? Go nuts.

and $voil\hat{a}$ – it all adds up.

Do quick, push-button formatting. Use outlining features to collapse



version 30. The result respondence course.



Take a look at the new Toolbar. In one step, you can now access style sheets, outlining features, Autosum, formatting options, drawing tools, charts of all kinds and macros. Go to town. or expand worksheets without having to variable you need?

create multiple files.

As for charting, we took our cue from Paul Woods, who began his letter with the salutation, "Charts, charts, charts!" Hey, Paul – check out the picture and caption for the full scoop.

Did we mention that you can consolidate up to 255 worksheets at a time, re-

gardless of format?

Or the Goal Seek feature, which lets you put in the total you want and works backwards from there to fill in the

Or the fact that this is the first System 7.0 application available?

Plus, you can update to version 3.0 for \$129. If you acquired your current version of Microsoft Excel on or after 12/7/90, the upgrade is only \$50. Call (800) 541-1261, Department Q83, to find out more.

By the way, Bryan Larson: we said hi to Bill for you. He sends his regards.

Microsoft

CONTENTS

DEPARTMENTS



On the Cover

For in-depth coverage of today's powerful DTP tools, see "Scanners in View," page 146; "Top-Notch Type," page 130; "Color Monitor Mirage," page 114; and "The Prepress Edge," page 138. (Illustration by Ron Chan.)



In News The monochrome/ gray-scale HP DeskWriter C moonlights as a three-color

printer, page 91.

How to Contact Macworld
MacBulletin
Commentary/Jerry Borrell 25 What the Apple-IBM agreement really means.
Letters
Art Beat
The Iconoclast
Conspicuous Consumer
Updates 81
News
New Products 203
How To/Quick Tips
How To/Getting Started with Customizing Databases 227
How To/Insights on Adobe Illustrator
Where to Buy
Best-Sellers

The Iconoclast Apple gets cozy with IBM—and the future

IBM—and the future looks grim, page 55.



FEATURES

By Charles Seiter As competition heats up in the 8-bit world, it gets harder to tell color monitors apart. We help you translate the differences into a sound buying decision.

Seeking ELF Relief

By Rory J. O'Connor Monitor makers have responded to consumer health concerns by designing displays with reduced electromagnetic emissions. Macworld Lab tests 32 color monitors to find out if those efforts have paid off.

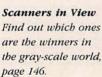
By Joe Matazzoni Today's electronic prepress options make it possible to do four-color publishing on the Mac-with quality results and fewer costs.

Scanners in View 146

By Steve Roth Macworld Lab puts 13 gray-scale scanners through their paces to separate the top contenders from the pretenders.

By Jim Heid Having access to powerful font technology isn't enough to make you a skilled typographer. In this fourth and final part of our series on digital type, we show you how to use Mac typographic tools to your best advantage.





REVIEWS

DC VCR

Computer-controlled stereo VCR.
PassProof
The American Heritage Electronic Dictionary 1.0
FontMonger 1.0.3162 Font-customization and format- conversion utility.
ColorSnap 32+ and QuickImage 24
boards. L-View Multi-Mode and QuickView Z21
Multimode monitors. NumberMaze Decimals & Fractions 1.01
Math education game for children. LabView 2
Instrument control software. The Oregon Trail and Wagon Train 1848176
Educational simulation games. Spaceship Warlock180 Interactive movie on CD ROM.
Masquerade 1.1182 Spreadsbeet compiler.
CDA-431 and PLI CD-ROM184 CD ROM drives.
TopDown 3.0
Earl Weaver Baseball 1.5186 Baseball game.
Mac-to-Mac 1.0.1191 Networked file-transfer utility.
M.Y.O.B. 2.0
FlexiTrace 1.01
The Desktop Critic
Diele 1 2 11 AppDiele 1 2 Mass

FKey 1.2; SCSIInfo; SCSIProbe;

Temperament 2.0.

NOTEBOOK SYSTEM

2

EXPANDABLE! 8

SMALLER. LIGHTER. FASTER.

New Mac-compatible notebooks are here NOW

Now, in a true notebook size, you can enjoy 68000 and 68030 processing and unprecedented expansion capabilities in just 6.25 pounds and 8.5 x 11 x 2.1 inches. Featherweights in size but true heavyweights in capabilities, all Outbound™ Notebook Systems have removable hard disk drives and microprocessors. That means they can be upgraded quickly when you

need more storage and power. Plus, the Outbound you choose is ready for action immediately because Macintosh® ROM is already installed. These are the ones you've been waiting for. They're from the "portable pros" at Outbound. We're the leader

at making them smaller, lighter and faster. So wait

no more.

Call Outbound today and get yourself a new Mac-compatible notebook computer.

1-800-444-4607

Each Outbound Notebook System is sold with a used Macintosh. Dutbound installs the ROM from the used Mac and repurchases the "shell" from the user. The user receives a ROM-equipped, ready-to-use Outbound.



The Outbound name and logo are trademarks of Outbound Systems, Inc. Macintosh is a registered trademark of Apple Computer, Inc.

Circle 30 on reader service card.

MACWORLD

Jerry Borrell

Editor-in-Chief and Executive Vice President

EDITORIAL

Executive Editor Adrian Mello Managing Editor Charles Barrett Assistant Managing Editors Luis A. Camus, Ruth Henrich Editorial Manager Jane Lagas Senior Associate Editor/Depts. Deborah Branscum Senior Associate Editor/Lab Manager Chip Carman Senior Associate Editor/Reviews Carol Person Senior Associate Editor/Features Suzanne Stefanac Senior Associate Editor/Features Cheryl England Associate Editor/Departments Cathy E. Abes Associate Editor/Features Galen Gruman Associate Editor/Lab Mark Hurlow Associate Editors/News Dan Littman, Tom Moran Associate Editor/Features Charles Piller Associate Editor/Features Liza Weiman

Assistant Editor/Reviews Mariorie Baer Assistant Editor/New Products Mary Margaret Lewis Assistant Editor/Lab Tim Warner

Senior Production Editor Ja Ann Villalobos Senior Copy Editor Katherine L. Ulrich Copy Editors Doreen J. Kan, Paul King, Felicity O'Meara Production Assistant Lisa Brazinal

Editorial Assistants Carolyn Bickford, Suzanne Courteau, Danny Lee **Editorial Administrative Assistants**

Evan Cooper, Lyn Taylor Assistant to the Editor-in-Chief Sandy Butler Contributing Editors Robert C. Eckhardt, Erfert Fenton, Rob Hahn, Jim Heid, Dave Kosiur, Steven Levy, Joe Matazzoni, Tom Negrino, David Pogue, Lon Poole, Steve Roth, Charles Seiter, Franklin N. Tessler, Bruce F. Webster

Overseas Editors Osmund Lind Iversen, Editor, Australian Macworld, tel. 02-439-5133: Peter Worlock, Editor, Macworld (U.K. edition), tel. 01-831-9252; David Ushijima, Contributing Editor, Japan

ART AND DESIGN

Design Director Dennis McLeod Art Director Joanne Hoffman Senior Designer Leslie Barton Senior Designer/Informational Graphics Arne Hurty Associate Art Director Sandra Koenig Assistant Art Director Kent Tavenaka Designer Hae Yuon Kim Associate Designer Matthew C. Nielsen Senior Design Associate Tim Johnson Design Associate Martha Katt

PRODUCTION

Director of Manufacturing Anne Foley Production Manager Claudia Dawn Smukler Advertising Billing Coordinator So Fong Yip Advertising Traffic Coordinator Arlette Crosland

President/CEO and Publisher, Macworld Communications, Inc. James E. Martin Assistant to the President Terri Edelman

October 1991, Volume 8, Number 10

Macworld (issn 0741-8647) is published monthly by Macworld Communications, Inc.,
501 Second Streat, San Francisco, CA 94107. Subscription rates are \$30 for 12 issues,
50 for 24 issues, and \$90 for 36 issues. Foreign orders must be prepaid in U.S. funds
with additional postage, Add \$18 per year for postage for Canada and Mexico
subscribers. Add \$59 per year for foreign postage to all other countries. Second-class
postage paid at San Francisco, California, and at additional mailing offices.
POSTMASTER: Sand address changes to Macworld, P.O. Box 54529, Boulder,
CO 80323-4529. Editorial and business offices: 501 Second St., San Francisco, CA
94107, 415/243-0505.

Beg, Borrow,



Introducing the PostScript-compatible LaserScript LX.

Forget about having to beg or borrow a printer, because at \$1,995 the LaserScript LX "is a steal. It's faster than a LaserWriter II NTX, with some features the NTX doesn't have. Like four active ports, so you can connect both Macs and PCs to the same printer—with or without a network. And automatic emulation switching, so you can switch between PCL4 and PostScript-compatible languages without using the front panel.

But the most attractive feature of the LaserScript LX is that all this performance won't break the bank—which is important in these economic times. For the dealer nearest you, call Abaton toll-free at (800) 444-5321 or (415) 683-2226. At \$1,995, it would be a crime to spend any more.

Circle 43 on reader service card

LaserScript LX

PostScript & PCL 4 emulation

2.5MB standard RAM

Auto-emulation switching

35 resident fonts

1 LocalTalk, 2 RS-232, 1 Centronics port 1 LocalTalk, 1 RS-232, 1 ADB, 1 SCSI port

All ports active

25 MHz processor

\$1,995.00*

LaserWriter II NTX

PostScript & PCL 4 emulation

2MB standard RAM

Manual emulation switching

35 resident fonts

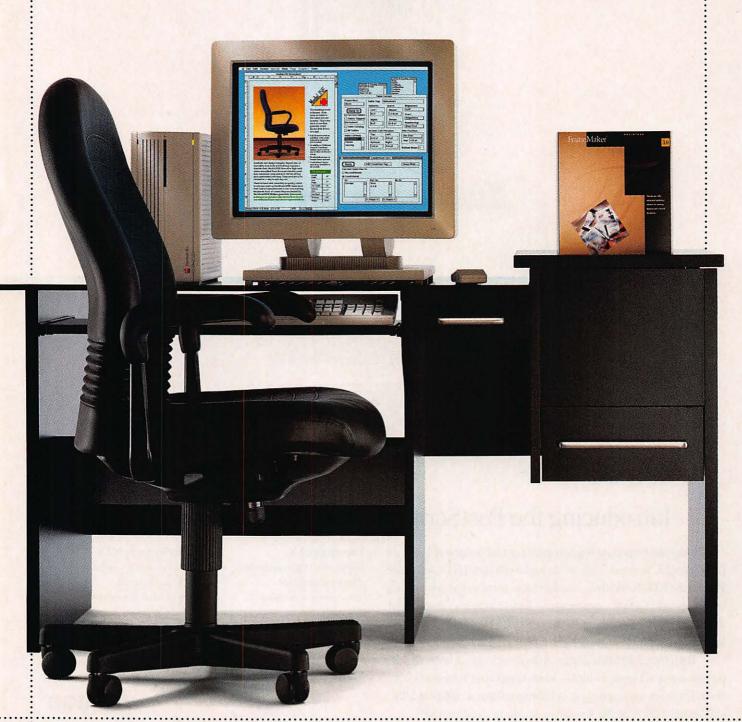
LocalTalk, 1 RS-232, 1 ADB, 1 SCSI p.
 Only one port active at a time

16 MHz processor

\$4,995.00*

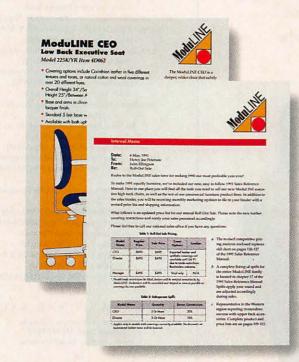


Frame Maker. The most comfort



Copyright © 1991 Frame Technology Corporation. International customers please call (408) 433-3311. FrameMaker and Frame Technology are registered trademarks, Frame and the Frame logo are trademarks of Frame Technology Corporation. Macintosh is a registered trademark of Apple Computer, Inc. All other trademarks or registered trademarks are the property of their respective holders.

able seat in document publishing.



FrameMaker's integrated table editor lets you easily create detailed tables with straddled cells, graphics, unlimited paragraphs, and rotated text within cells.



In long, structured documents, FrameMaker automatically reformats the entire document, updating page numbers, paragraph numbers and multichapter cross-references.

Circle 60 on reader service card

o experience a whole new comfort level in document publishing, have a seat in front of a Macintosh* running FrameMaker.*

- ► FrameMaker integrates the entire publishing process into one easy-to-use application: Authoring, editing, graphics, page layout, production, even hypertext. Whether you create short, simple documents or long, structured documentation, you'll feel right at home with FrameMaker.
- ▶ You'll find our new version, FrameMaker 3.0, even more inviting. You can create your own intricate, multipage tables with its sophisticated table editor. And generate and maintain multiple versions of a single document with its conditional text capabilities. You can even import full-color images and produce four-color output of DCS images.
- That's the kind of innovation that earned FrameMaker an Editor's Choice award from MacWEEK and accolades from MacUser.
- And of course, it's compatible with System 7.0.
- So call 1-800-U4-FRAME ext. 955 for more information on FrameMaker 3.0 and the name of your nearest reseller. And feel how comfortable a position in publishing can be.

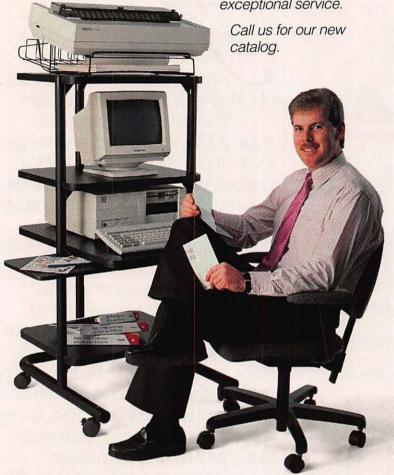




AnthroCart

The best furniture you can buy for your equipment. Incredibly strong. Mobile. Flexible. Space saving. Lifetime warranty.

Choose different sizes and colors. Add the accessories you want. Discover Anthro's exceptional service.



Free Catalog: 800-325-3841 6:30 AM to 5:00 PM PST



TechnologyFurniture®

3221 N.W. Yeon St. Portland, OR 97210 (503)241-7113 Fax: (503)241-1619

GSA contract No. GS-00F-5040A Available for OEM applications Made in USA Prices start from \$159 We ship in 48 hours









Anthro, AnthroCart and Technology Furniture are registered trademarks of Anthro.

MACWORLD

ADVERTISING SALES

Vice President/Director of Advertising Sales Patricia Navone (415/243-0505) Assistant to the Vice President/Director of Advertising Sales Yuen Yeh (415/978-3258) Associate Advertising Director William P. Peck (415/243-0505)

No. California (San Jose, South) Cherie La France (415/243-0505)

Sales Associate Shannon Smith No. California (West Bay), Washington, Wyoming, Western Canada Regina T. Salaices (415/978-3155) Sales Associate Edward Ramirez No. California (Northern Peninsula, Marin) Beverly Schneider (415/978-3138) No. California (East Bay), Idaho, Montana, Oregon Suzanne Young (415/978-3262) Sales Associate Jill Nightingale Southwest/Midwest Advertising Manager Shannon Dolan

Midwest Lisa Ladle (708/827-4477) Sales Associate Stacy Holman So. California Paul Dudas (714/250-1307) Southwest, Texas Cathi Tucker Bledsoe (714/250-1307) Sales Associate Marsha Bowers (714/250-1307)

Eastern Advertising Manager Bill Thompson (201/967-1350) Mid-Atlantic Annette Bremer (201/967-1350) New England/Florida Joan Flynn (508/879-0700) Sales Associate Susan Cardoza Southeast Office (404/394-0758) Macworld Catalog Carol Johnstone, Wendi A. Smith (415/978-3152, 415/978-3117) Macworld Billboard Niki Stranz (415/978-3105)

INTERNATIONAL SALES

Director of International Sales Shannon Dolan (415/243-0505) Sales Associate Darien Werfhorst

MARKET RESEARCH

Director of Research Gary L. Rocchio Research Assistant Peter Summersgill

Vice President/Marketing and Circulation **Daniel Orum**

MARKETING

Marketing Associate/Events and Merchandising Lisa Espinoza

Marketing Communications Manager Kimberlee Luedee

Marketing Communications Assistant Annette Garcia

CIRCULATION

Director of Circulation Lindsay Davidson Single-Copy Sales Director George Clark Assistant Subscription Manager Lori Hitchcock Single-Copy Sales Rep Martin Garchar Subscription Analyst Elizabeth Jensen Subscription Coordinator Susanna Camp Administrative Assistant Marjorie Maggenti

ADMINISTRATION

Director of Finance Vicki Peilen Corporate Business Manager Christina W. Spence Accounting/Operations Manager Pat Murphy Director of Human Resources Shelly Ginenthal Director of Information Systems Walter J. Clegg Accounting/Facilities Manager Michelle Reyes Financial Analyst Madeleine Buckingham

Founder David Bunnell Founding Editor Andrew Fluegelman 1943-1985



Yes! Send me the upgrade version of Quicken 3.0 for my Macintosh for just \$29.95 (includes shipping). I have enclosed the title page from my Quicken Users Manual. No photocopies, please.

Allow 15 working days for delivery in the U.S.; slightly longer in Canada. International shipping extra.

□ Visa □ MasterCard □ AmEx □ Discover Exp.Date Signature

Equipment required: any Macintosh computer with at least 1 megabyte of RAM, one or more floppy disk drives, or a hard disk, and system 4.1 or later. Guaranteed to work with all printers and monitors or your money back. CheckFree not available outside the U.S. Not copy protected.



Ad Code: MW10E

This just might be as portable as a 40MB drive ever gets.

Among the many interesting objects you've wedged into your pockets over the years, we can safely guess that a 40MB hard drive wasn't one of them.

Because until now, no 40MB drive has come close to being anywhere as small, portable, and easy to use as the new La Cie PocketDrive™

Who says you can't take it with you?

After you've seen a PocketDrive, the ultimate truth is going to hit you like a bolt of lightening: as long as you're buying a hard drive, why not get one that's easy to take with you and doesn't hog any desk space when you get there? Especially when PocketDrive offers all-new 2½ inch drive technology, fast 19 ms seek time, and whisper-quiet operation.

You've heard that compact drives are a pain to connect and disconnect? Not anymore. Instead of plugging directly into the back of your Mac,® PocketDrive connects to a cable. So you don't have to root around at the back of your computer, connecting, disconnecting, and reconnecting everything. And PocketDrive comes with two cables, allowing you to leave one cable at work and one at home, plus a T-connector so you can plug PocketDrive into any other Mac.

A funny thing happens when you use 21/2" Quantum drives.

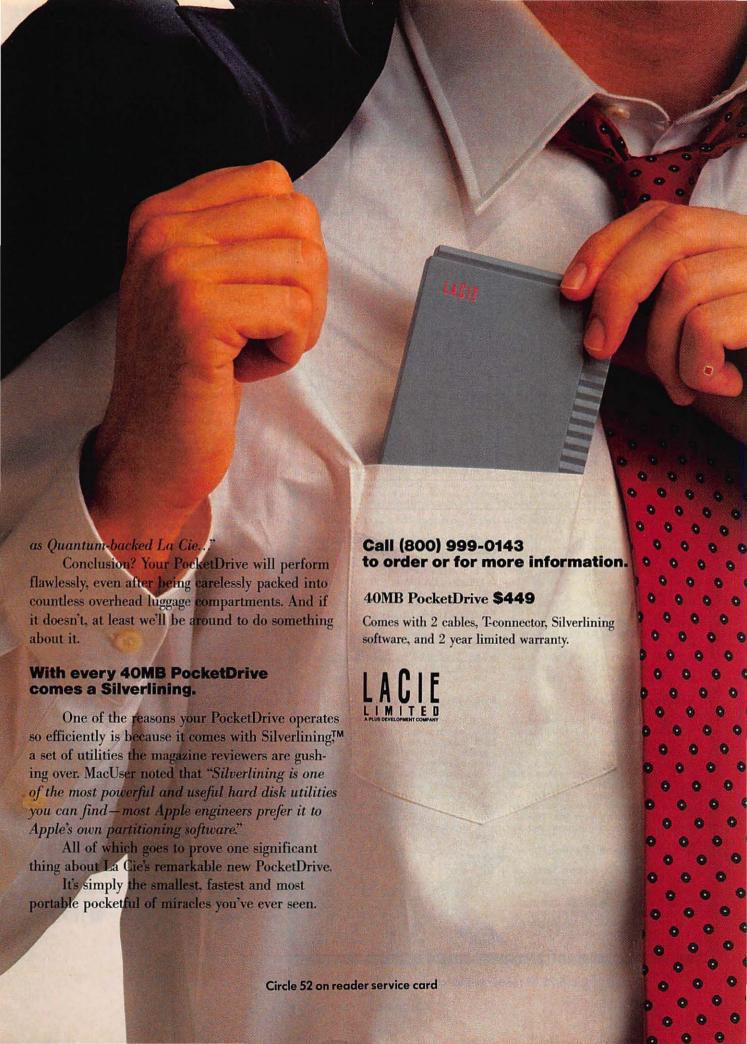
They work and work and work. For what seems like forever.

La Cie's enviable reliability record is due to the fact that we use Quantum's ultra dependable drive mechanisms.

In fact, our reliability as a hard drive manufacturer and stability as a company prompted a MacWeek columnist to observe... "The Good Housekeeping Seal. I'm now taking the safer course of buying from corporate-owned companies such

PocketDrive, Silverlining, La Cie and the La Cie, Ltd. logo are trademarks of La Cie, Ltd., a Plus Development Company. All other trademarks are the property of their respective owners. All prices, specifications, terms and

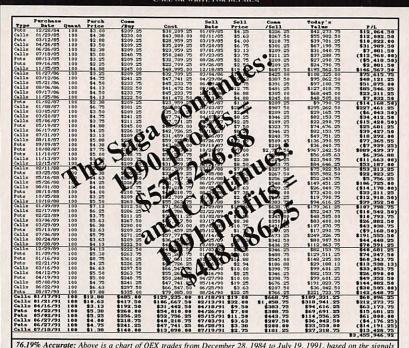
descriptions of products and services herein are subject to change without notice or recourse. La Cie, Ltd., 19552 SW 90th Court, Tualstin, OR 97062. Phone (503) 691-0771, Fax (503) 691-5590. La Cie, Ltd. 1991. All rights reserved. Printed in U.S.A.



Not owning our Index Program may have cost you \$3,455,946.92.

ALL PROGRAMS NOW COME WITH A 30-DAY MONEY BACK GUARANTEE.

CALL OR WRITE FOR DETAILS.



76.19% Accurate: Above is a chart of OEX trades from December 28, 1984 to July 19, 1991, based on the signals generated by the Right Time-Index Program™. By following the signals generated by the program, the rules in the manual and starting with just a small amount of capital (\$30,209.25) your profits would have been over \$3,400,000.00.

WE NOW CARRY MACINTOSH & IBM COMPATIBLE COMPUTERS AT EXCELLENT PRICES.

investor.

The Right Time™ computerized trading system was developed by an expert portfolio manager for his own personal use. Over the last ten years of in-market use the software has been perfected and made easy to use. Now it's available for any smart trader who wants to make quick profits from quick decisions. Just look at the profits generated in the above chart!

Not only is **The Right Time™** the best decision support system ever devised for traders, it's the <u>only</u> software that analyzes volume/price, support/demand, and global market trends – all at the same time.

AMAZINGLY PRECISE.

The Right Time™ programs run on IBM (and compatible), Apple II and Macintosh personal computers. The software is easy to use, amazingly precise, and very, very clear in its signals.

You can retrieve and update signals for your stocks, commodities, indices or funds from Dow Jones, Warner, Signal, DBC or the Radio Exchange in less than five minutes per day. What's more, you can play "What If" games and have results in about one second.

RESULTS: WINNING TRADES.

There are nine Right Time™ programs available to help you make the right decisions at the right time.

• Stock Program & Stock Program/ Long Term: "The program is amazing. Profitable trades have developed out of nowhere!" M.C., brokerage firm VP.

complete manual.

T.B.S.P. INC.

• Index Program & Index Program/ Long Term: "Computer whiz finds program for success. This program really works." A.G. columnist. • Futures Program: "Very profitable

with four out of five winners. Paid for itself the first trade." B.L., investment advisor.

• Mutual Funds Program: "Accurately picked my last seven profitable trades. I couldn't trade without it." L.S., individual

Day Trading Program/Index, Futures or Stock: "The Day Trading Pro
Trading Pro-

Call (800) 755-TBSP or write for our free twenty page brochure or to place your order. Each end-of-day programs costs \$599, any

two \$999, any three \$1399, any four \$1699, any five \$1999 or all six for just \$2399.

for \$59 (each) Each demo includes our

Our Right Time – Day Trading Programs (Index, Futures or Stock) are priced at \$999

each, two for \$1799 or all three for just

Demonstration programs are available

grams are sensational." P.S., investor.

FOR MORE INFORMATION.

The Better Software People 610 Newport Center Dr., Suite 1120 Newport Beach, CA 92660 (714) 721-8603 Fax: (714) 721-8635 Hours: 8 am – 5 pm M-F Pacific Time

All programs not available for all computer

re results may vary

MACWORLD

HOW TO CONTACT MACWORLD

Subscription Services

For subscription service questions, call 800/234-1038, 800/525-0643, or 303/447-9330, or write Subscriber Services, P.O. Box 54529, Boulder, CO 80322-4529. To place orders, call 800/288-6848. For dealer inquiries, call 800/99-1170.

Macworld on America Online

Macworld subscribers can contact Macworld editors online via the Macworld area on America Online. The area features reviews, news, new-product announcements, version information, a database of products, and Macworld-sponsored message boards and conferences. Several of our editors log on on a regular basis. To obtain a free America Online software kit, call 800/227-6364, extension 5254.

Macworld in Microform

Macworld is available on microfilm and microfiche from UMI, 300 N. Zeeb Rd., Ann Arbor, MI 48106-1346, 313/761-4700.

Back Issues of Macworld

Write to: Back Issues of *Macworld*, 144 Townsend St., San Francisco, CA 94107; \$6 per issue (\$20 overseas). Prepayment in U.S. funds necessary.

Macworld Editorial

Mail or Courier Macworld Communications, Editorial Dept., 5th floor, 501 Second St., San Francisco, CA 94107; 415/243-0505.

AppleLink: Macworld1 Connect: Macworld1 CompuServe: 70370, 702 Fax: 415/442-0766 Letters to the Editor All written comments, questions, and suggestions regarding any aspect of the magazine are read by our editor. We reserve the right to edit all submissions; letters must include your name and address. Direct all correspondence (by mail or electronically) to: Letters to the Editor.

or electronically) to: Letters to the Editor.

Questions and Quick Tips Direct questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to: Quick Tips, Lon Poole.

Consumer Advocate Been burned? Really steamed? Direct your concerns (by mail or electronically) to: Conspicuous Consumer, Deborah Branscum.

New Products and Updates Direct press releases and

product announcements (by mail or electronically), and shrink-wrapped software upgrades (by mail or courier) to: New Products Editor.

Editorial Calendars For a copy of *Macworld*'s editorial calendar, direct requests (by mail) to: General Information, Editorial Dept.

Information, Editorial Dept.

Reprints and Photocopy Permission Permission will be granted by the copyright owner for those registered with the Copyright Clearance Center (CCC) to photocopy any article herein—for personal or internal reference use only—for the flat fee of \$1.50 per copy of the article or any part thereof. Specify ISSN 0741-8647 and send payment directly to the CCC at 27 Congress St., Salem, MA 01970. Address requests for reprint orders and for permission to copy editorial for other purposes to: Reprints and Permissions, Editorial Dept.

Writing for Macworld Please do not send us unsolicited manuscripts. If you're interested in writing for Macworld, send a stamped, self-addressed envelope along with a request for our writer's guidelines. Direct (by mail) to: Writer's Guidelines, Editorial Dept.

Macworld is a publication of Macworld Communications, Inc. Macworld is an independent journal not affiliated with Apple Computer, Inc. Macworld is a nejstered trademark of IDG Communications, Inc. APPLE, the APPLE LOGO, MAC, and MACIN-TOSH are registered trademarks and MACILETTER is a trademark of Apple Computer, Inc. Printed in the United States of America. Copyright © 1991 Macworld Communications, Inc. All rights reserved. Mexoworld is a member of IDG Communications the world's largest publisher of computer-related information. IDG Communications publishes over 150 computer publications in more than 49 major countries. Nineteen million people read one or more IDG Communications publications each moreth.





© T.B.S.P. Inc. 1991

Dial into your network.



From anywhere.

When you want remote access to your network, you should use the best solution. NetModem® by Shiva. The industry standard in remote network communications.

EASY ACCESS

NetModem has features no network should be without. For instance, it allows



remote users with a Mac and modem to dial in and access all network resources, like file servers, electronic mail, laser printers and more-even run network applications. The exact same way you would at the office.

CENTRAL MANAGEMENT

And unlike software-only solutions for remote access, NetModem's hardware based approach doesn't require a dedicated computer on the network. And you can manage

every NetModem on your network from one location—even remotely. With NetModem, you can even specify how much of the network remote users can access: the whole network or just the zone where the NetModem is located.

A FAMILY OF OPTIONS

NetModem is available in 2400 bps and 9600 bps versions. With models for LocalTalk or Ethernet.

So if you're considering a dial in solution for network access, consider NetModem. And if you already have a modem, ask us about TeleBridge or EtherGate.

Just call **1-800-458-3550**, **617-252-6300** or fax **617-252-6852** to see what solution Shiva has that's best for you.

NetModem® by Shiva

Shiva Corporation, One Cambridge Center, Cambridge, MA 02142

All product names are trademarks or registered trademarks of their respective companies.



000000

PIUSGRAPHICS

Everyone agrees that the *Typist*™ is the best thing that ever happened to hand scanners. The ability to read words and numbers easily and accurately really makes a difference when you're pressed for time. Or like most people you simply hate to type.

With the *Typist* you can scan almost any document just like you were typing it yourself; into just about any PC compatible or Macintosh® word processor, spreadsheet or database.

It's not surprising then that the *Typist* has so quickly become the hand scanner of choice when it comes to OCR. The clear standard.

So you might say that the writing was already on the wall, and it was only a matter of time before the *Typist* allowed you to scan and edit graphics as well.

That's why Caere® Corporation created the *Typist Plus Graphics*™, the hand scanner that adds yet another dimension by allowing you to scan and enhance photos, artwork and illustrations with incredible ease and accuracy.

The *Typist Plus Graphics* lets you put your best image forward because of a major innovation called the *Graphic Editor*™, which creates full tone images – 256 shades of gray – in software. You can display grayscale images up to the full capacity of your screen; modify and edit in either grayscale mode for photographs, or black and white mode for line drawings; and later output in picture perfect form.

In fact, when it comes to printed output, the *Typist Plus* includes *LaserGray*[™], yet another proprietary technology from Caere. So you can print halftones that look just like grayscale images. The photos that



you modify on-screen have a crisp, sharper look and feel. A professional touch.

Just think of what the addition of picture perfect graphics can mean for your business or profession.

Use the *Typist Plus Graphics* to capture photos that you can incorporate into your most critical business presentations or reports. Scan company logos and place directly onto your stationary, invoices or slide presentations. You can add graphics to all of your Macintosh desktop published documents, including training manuals, newsletters —

even invitations to company events.

The word is out about the *Typist Plus Graphics*. Now you get the full picture – words and graphics – in one intuitive and easy-to-use hand scanner.

To learn more about the *Typist Plus Graphics* and how it can be of assistance to you, contact one of Caere's authorized dealers. Caere, the Complete Recognition Company.

For more information:

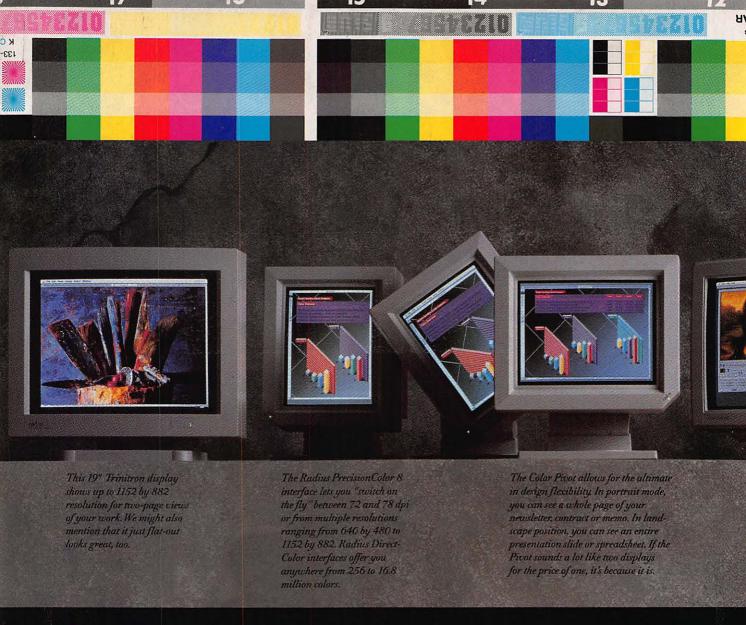
Call: 1-800-535-SCAN

Write: Caere Corporation 100 Cooper Court Los Gatos, CA 95030

CAERE®

Caere and the Caere logo are registered trademarks of Caere Corporation. Graphics Editor and LaserGray are trademarks of Caere Corporation. All other ©registermarks and TMtrademarks are of their respective companies. ©1990 Caere Corporation. All rights reserved.

Circle 1 on reader service card



Everything You Need For Color Publishing. Or

The benefits of the most complete, most

the Radius Color powerful, most advanced color system on the

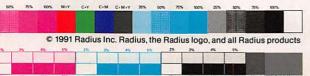
market are not always easy to gauge. But if we

can use free time, disposable income, and

smiling faces as any sort of a yardstick, then

the Radius Color where the Radius Color was acceleration and acceleration and the Radius Color was acceleration and the Radius Color was acceleration and acceleration and the Radius Color was accelerated to the Radius Color was accelerated to

the Radius Color system is an unqualified success. • Here under one name is everything you need for all your color publishing and design applications. Whether you want acceleration and image capture, or compression





MAGENTA BLACK



THE ART OF WINNING



WIN INSTANTLY FREE radus

COLOR SYSTEM

PLAY NOW! WIN NOW! Instructions: For a chance to win an instant prize, scratch off the ink from any 3 boxes to uncover 3 matching messages. Game cards submitted with more than 3 boxes uncovered will be considered void and unacceptable. Proof of purchase may be required to claim prize. See Rule #3 for more information.

UNCOVER 3 BOXES ONLY

Your name					
Title					
Company name_					
Company address	s				
CitySta			ite		
Zip		Day phone ()			
Radius product pur	chased: 🗆 P		iome use,		
If prize claimed is a If prize claimed is a			payable to: shipped to company add	lress shown above.	
			L RULES		
1. Rub off the ink from any same prize description in thre	three (out of six) be boxes, and compl	oxes appearing on th	ne face of this card for a chance to u , you are a winner of that prize. To cl	ncover a prize. If you uncover the aim your prize see Rule #3 below.	
2. The following prizes are available: Prize Description Prizes Available Odds of Winning		Note: All Radius product purchases must be made between August 1, 1991 and November 30, 1991, and received by December			
Radius PrecisionColor™ Calibrator*	500,000	1 in 2	31, 1991. Mail all prize cloims described above to: Radius Winners P.O. Box 4346 Santa Clarz. California 95056-4346		
Radius Impressit™**	500,000	1 in 2			
Compression Software \$200 cash rebate off a	1,000	1 in 1,000	Grand Prize	1 7000-4340	
Color Pivot™ Display S500 cash rebate off a Radius	1,000	1 in 1.000	Complete Radius Color System:	No purchase required. Mail in	
Rocket ** Accelerator Complete Radius Color System valued at \$12,000 "Suggested list price \$695. ""Sugges	5	1 in 200,000	Two Page Color Display with 24- bit Interface; Radius Rocket " Accelerator; Impressit"; Precision- Color " Calibrator	your winning game card by Registered Mail to: Prize Winners, P.O. Box 26811, San Francisco, CA 94126.	
3. Follow these instructions to claim your prize:			4. Unclaimed prizes will not be awarded. No prizes will be awarded		

Radius PrecisionColor™ Calibrator, or Radius Impressit™ Compression Software

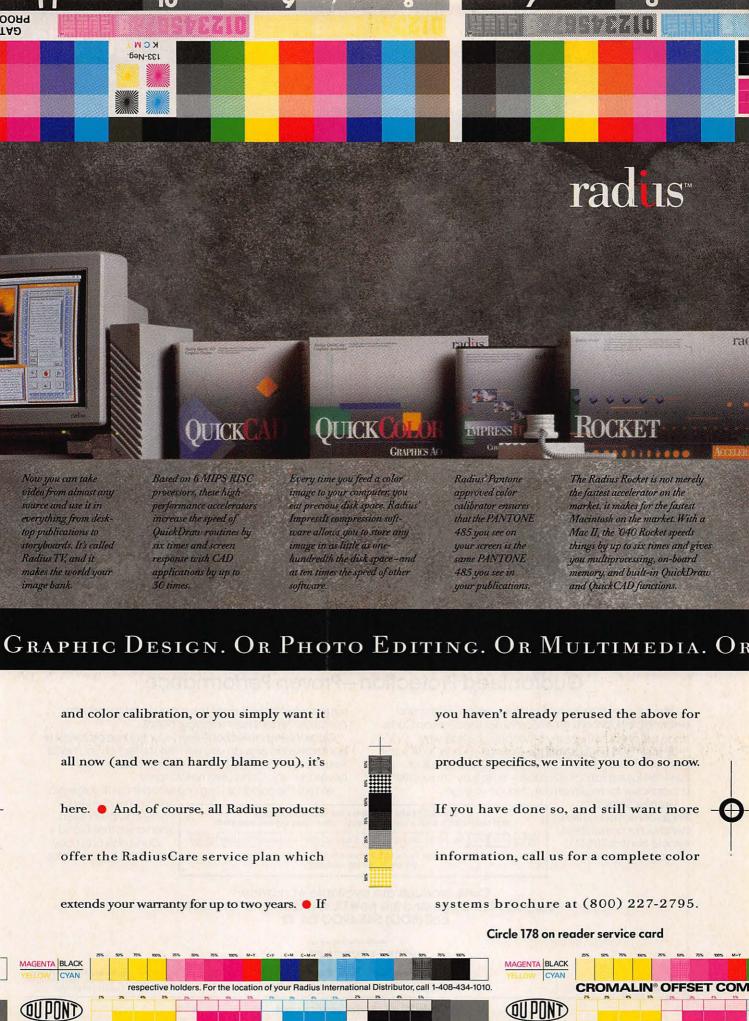
S200 rash rebate

\$500 cash rebate

Purchase any Radius Two Page Color Display and mail in your winning game card, a copy of the warranty card (from a Radius Iwo Page Color Display), and a copy of your invoice (dated August 1 through November 30, 1991) from an Authorized Radius Reseller to verify proof of purchase.

To receive a check for \$200, mail in your winning game card, a copy of the warranty card (from your Radius Color Pivol Display) and a copy of your invoice (dated August I through November 30, 1991) from an Authorized Radius Reseller to verify proof of purchase. To receive a check for \$500, mail in your game card, a copy of the warranty card (from your Radius Rocket ** Accelerator) and a copy of your invoice (dated August 1 through November 30, 1991) from an Authorized Radius Reseller to verify proof of purchase.

- if front or back of game card is found to be incomplete, illegible, mutilated, forged, tampered with, or irregular in any way, if this game card contains printing or other errors of omission, or if more than three boxes are uncovered.
- 5. All prize claims must be received by December 31, 1991, at which time game officially ends and no further prizes will be awarded.
- 6. This program is not open to employees of Radius Inc., its advertising agency personnel, affiliated game reproduction organizations, Radius Authorized Resellers or Developers or their families. Void where prohibited by law. All federal, state and local regulations apply. Prize winners are solely responsible for any taxes. No substitution of prizes allowed. Good only in U.S.A. Not valid with any other Radius promotional offers.
- 7. Winners should make a photocopy of their winning game cards, and should allow 6 to 8 weeks for delivery of prizes. No responsibility is assumed for lost, misdirected or late mail. Winners may be required to submit an affidavit of eligibility, and must be 18 years of age to participate.
- 8. For a list of Grand Prize winners, send a stamped, selfaddressed envelope to: Winners List, P.O. Box 26811, San Francisco, CA 94126





You Can't Buy A Better Surge Protector Than Curtis Guaranteed Protection—Proven Performance

When it comes to protecting their valuable data and electronic equipment, more computer users rely on Curtis surge suppressors than any other brand. Here's why:

UL 1449 TVSS Lowest Voltage Ratings—Every Curtis surge protector has achieved a rating of 400 volts peak or less—the lowest ratings available—in tests by Underwriters Laboratories for maximum let-through voltage.

Greater Selection-Single or multiple outlets, switched or unswitched. remote control, EMI-RFI filtering, phone line

surge protection—choose the surge protector with the combination that best suits your needs.

Guaranteed Protection* Every Curtis surge protector is guaranteed to provide you with the protection you need. And most are backed by the industry's best warranty coverage—the Curtis Lifetime Warranty.

With all this going for them, no wonder Curtis surge pro-

tectors are owned by more computer users than any other brand.

Curtis. You can't buy a better surge protector.

UL Standard 1449 TVSS tests the maximum voltage that can pass through a surge supressor after clamping has occurred.

330 400 500 600 800 1000 1200 1500 2000 2500 3000 4000 5000 6000 HIGHEST

All Curtis Surge Protectors are rated at 330 or 400 Volts Peak the lowest ratings available.

Curtis products are available worldwide. For your FREE "Surge and the new UL 1449 Standard" brochure, call (800) 548-4900 Ext. 42

30 Fitzgerald Drive, Jaffrey, NH 03452-1931

*Surge protectors are not lightning arrestors and cannot be guaranteed to protect against direct hits.

MACBULLETIN

Apple to Bring Its 21-Inch Color Monitor to the U.S.

In October Apple is expected to offer its Macintosh 21" Color Display to customers in the U.S. for the first time, according to sources close to the company. Apple announced the two-page monitor in early June for early-July shipment but so far has distributed it only through its subsidiaries outside the U.S. The monitor has been the target of criticism from third-party vendors who feel that its introduction infringes on a critical market that they pioneered (see July *MacBulletin* and September *News*). Assembled in Italy using a Japanese CRT tube, the monitor is designed to reduce VLF and ELF magnetic-field emissions. The monitor's international guideline price was set at \$5550 at the June announcement.

Apple Posts Record Loss

In the wake of massive layoffs, Apple Computer reported a \$53.1 million loss for the third fiscal quarter, which ended in June. The loss resulted from a \$224 million one-time charge due to the heavy costs of the layoffs, restructuring of Apple's management and manufacturing, and other cost-reducing measures, according to Apple. Total revenues were up in the same quarter, from \$1.365 billion last year to \$1.529 billion. Apple chairman and CEO John Sculley predicted that the restructuring will make Apple more competitive in the future.

Thunder Boards Rev Up Mac Graphics

SuperMac has announced the Thunder/8 and Thunder/24, 8-bit and 24-bit graphics boards that can drive large-screen monitors and accelerate Quick-Draw by up to 500 percent. Both boards display resolutions from 512 by 390 up to 1152 by 870 on monitors ranging in size from 12 inches to 21 inches. Both also have a connector for adding future enhancements from SuperMac, possibly including image compression or additional acceleration. The two boards work with System 7 and will be compatible with 68040-based NuBus Macintoshes expected from Apple, according to a SuperMac representative. The boards support Apple's Macintosh 21" Color Display, which is currently available only outside the United States. The Thunder/ 8 has a list price of \$1899, and the Thunder/24 lists for \$4999. Both were expected to ship in August. For more information, contact SuperMac at 408/245-2202.

Hard Work

Hard on the heels of Symantec's integrated package GreatWorks (see News in this issue), Beagle Bros. Software is pulling on its boots with BeagleWorks. BeagleWorks has paint and draw tools, a spreadsheet, a database, word processing, charting, and communications; pieces of each (except communications) can exist side by side in a single document, with hot links to the source documents. Many functions can be used in all the modules-for example, you can check spelling in a database, zoom in or out on any page, and split any window into two or four views. Like most integrated packages, BeagleWorks' feature set is somewhat limited, but the program does support 8-bit color in the paint and draw modules, true style sheets, and text that automatically wraps around objects in the word processor. The package will list for \$299.95. Beagle Bros. is at 619/452-5500.

Mergers and Acquisitions

Buy-outs and agreements are changing the face of the software industry. Giants Ashton-Tate and archrival Borland plan to merge, though dBASE and Paradox, the companies' competing database products, are incompatible. Closer to home, MacroMind and Paracomp are merging. The two companies' products are largely complementary-for example, Paracomp's Swivel 3-D is a 3-D modeler, and MacroMind 3-D renders models created in other packages-but Paracomp recently fielded Film-Maker, which competes head-to-head with Macro-Mind's flagship, Director. The new company, to be called MacroMind/Paracomp, has not established offices. Also, ChipSoft, which shipped its first Mac version of TurboTax this year, has acquired Softview, whose MacinTax long dominated the Mac taxsoftware market.

Apple Discontinues Many Hard Drives, May Deal with Microtech

Apple has agreed to farm out all of its external hard drives to Microtech International, according to sources close to the companies. As part of Apple's recent restructuring, Microtech will manufacture Apple-labeled external drives and ship them to Apple for distribution. The sources said that the move will allow Apple to concentrate its resources on designing future personal computers. Apple recently removed (continues)

all but one of its external hard drives from its price list, leaving only the Apple Hard Disk 80SC still shipping.

Hayes Introduces High-Speed Modem

Hayes Microcomputer Products has introduced the V-series Ultra Smartmodem 14400 modem, which has a line speed of 14.4 Kbps and offers V.42bis modulation for data rates of up to 38.4 Kbps. The modem can connect to ISDN, X.25, and IBM SNA networks. It provides synchronous communication via Hayes AutoSync, supports PABXs, and can talk to the installed base of proprietary Hayes V-series Smartmodem 9600 modems. The Ultra 144, slated to ship in August, will list for \$1199. For more information, contact Hayes at 404/441-1617.

Shiva Hublet Expands 10BaseT Networks

Shiva Corporation has announced the Hublet, a port repeater that lets Ethernet administrators expand their 10BaseT networks without running extra cables to the wire closet. A single 10BaseT outlet with a Hublet attached supports up to four workstations, Macs, IBM PCs, or other devices. The Hublet requires that the 10BaseT network include the Link Test protocol. Shiva expected to ship the port repeater in late July at a list price of \$399. For more information, contact Shiva at 617/252-6300.

Watching the Clock

The number of calendar keepers and information managers for the Mac is burgeoning. One of the most full-featured, MyTimeManager (MTM), adds some System 7 features in version 3.5. MTM has day, week, and month views of a calendar as well as a scrolling list of unscheduled to-do items. The program can filter items by user-definable categories and other criteria; provides free-floating text memos; and can search memos and calendar items. MTM's alarm feature does not require an INIT, which is a mixed blessing (MTM doesn't slow down the Mac as INIT-based alarm systems do; on the other hand, MTM must be running to notify you of an alarm). MTM does not allow you to drag events between days; you must change the calendar setting of a task just to move it, and MTM does not let you schedule overlapping events or interrupt an event. Under System 7, MTM can pass messages among MTM users, has an in/out board feature, and can schedule meetings for groups. It lists for \$79.95. For more information, call Mac-Shack at 617/876-6343.

New Money

Intuit is bumping the version number of its checkbook manager, Quicken, from 1.5 to 3.0 and redirecting the program's focus to personal-finance management. With 3.0 you can set up expense categories and subcategories and assign transactions to them with pop-up lists; split transactions across multiple categories; create recurring transactions with or without fixed amounts; manage net worth and loans; and customize the program's eight home reports and eight business reports. The new Quicken has a built-in spreadsheet and can maintain a general ledger, accounts receivable, and accounts payable. It lists for \$69.95. Intuit is at 415/ 322-0573. Quicken is still nouveau riche next to MECA's Managing Your Money 4.0, which shipped last winter with a vast set of tools for dealing with such financial issues as life insurance and pensions, estimating taxes, saving for your kids' college expenses, building a portfolio, analyzing investment opportunities, estimating life expectancy, and planning for retirement. Managing Your Money lists for \$119.95. MECA is at 203/256-5000.

Big Projects

Mac project managers are getting some big help. Micro Planning International is fielding a simplified package called MicroPlanner Manager; the formerly privately distributed Task Monitor is now available commercially; and mainframe vendors are sniffing out the Mac market (see following bulletin). The \$595 MicroPlanner Manager has an internal desktop with folders for charts, reports, and projects. It supports creating projects in outline, table, Gantt, or PERT view; has a very flexible report-design module; supports multiple baselines; and can split tasks to optimize resource allocations. Micro Planning is at 415/389-1420. Monitor Systems' \$695 Task Monitor is a high-end scheduler (a resource module is in development). It provides pessimistic, optimistic, and most-likely completion dates; has five work-breakdown structures; can draw dependency lines on the Gantt chart; and can arrange the PERT chart based on task dates. Monitor Systems is at 415/949-1688.

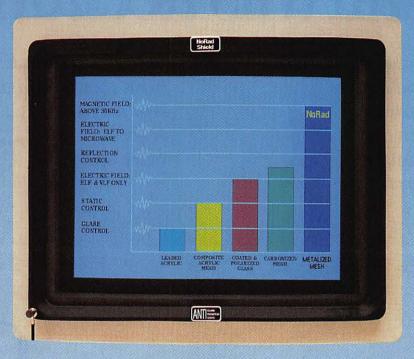
Artemis Lays Plans for the Mac

Lucas Management Systems, which publishes the mainframe project-management package Artemis, will market a \$2000 Macintosh package called Schedule Publisher. Schedule Publisher's most unusual feature is its ability to incorporate reports designed with draw or presentation software. It also provides translators for exchanging data with Artemis on minicomputers and mainframes. Lucas Management Systems is at 703/222-1111.

Database Publishing

Timeworks' Publish-It Easy version 2.1 is proof that System 7's interapplication communication won't be the death of omnibus programs. The new Publish-It, which is System 7-compatible, adds an internal database and mail merge capability to a full-featured page-layout package. The database can hold 32,000 records with up to 255 fields. The program's price remains \$249.95. Timeworks is at 708/559-1300.

Anti-Radiation Screens. What's The Difference?



Only One Does It All. NoRad.

The **NoRad Shield** ™is the only product that performs the tasks others try to do. Some claim to reduce ELF and VLF radiation, but fall short when test time arrives. Most of them cut down radiation in the electric field only. The NoRad Shield blocks the *entire* range of electric fields *and* the high range of magnetic fields.

- Electric Radiation Virtually the entire spectrum of electric field radiation is blocked by more than 99.99% - from ELF through VLF and beyond, up into the microwave range.
- Magnetic Radiation Magnetic radiation is cut down by more than 50% in frequencies above 30 KHz, to levels no other screen manufacturer offers.

Some screens reduce glare, but actually increase reflections because they're made of polished glass. The NoRad Shield's high-resolution screen tackles these two problems handily and also eliminates the static field which attracts dust to your monitor and propels dust to your skin and eyes.

Why buy a screen that only does a fraction of what you need, when one does it all? **NoRad.**



The NoRad Shield is available in several models to fit virtually all IBM®PCs and compatibles, terminals and large format displays.



The NoRad Shield fits Apple® and Macintosh® displays, and is available in a platinum-colored frame for the SE and the Classic.

Call now to learn more about the **NoRad Shield** and receive your free MYTHS AND FACTS OF ANTI-RADIATION SCREENS booklet.



1-800-262-3260

NoRad

NoRad Corporation 1549 11th Street Santa Monica, CA 90401 (213) 395-0800 FAX: (213) 458-6397

Circle 292 on reader service card

With all this acclaim, you

"The MSF-300Z color/gray scanner is a breakthrough product in price, image quality and value. Microtek has set a clear standard for affordable, quality color scanning." MacUser March 1990



"At \$2,695, Microtek's scanner isn't only the least expensive flatbed scanner we looked at, it's also **** **FIVE STAR AWARD 1990** the best." Publish March 1990

Guess

Introducing the ScanMaker family of affordable flatbed and slide scanners.

Microtek's color scanner has consistently earned awards, praise and top ratings as the best value in scanning. But, if you thought we'd rest on our laurels, we've got news for you.

The leader in high quality, low cost scanning is at

> it again with the ScanMaker 600Z. The all new ScanMaker 600Z is the perfect tool for desktop publishers who demand outstanding image

quality and versatility in a flatbed scanner.



From presentations and newsletters to pre-press and comp work, the ScanMaker 600Z handles it all. It boasts 24 bit.

The totally redesigned ScanMaker 600Z offers bigber resolution for a lower price.

color, 8 bit grayscale and an incredible 600 dpi resolution.

But the most dramatic news is that we've given it an incredible low price to match.

Add to

that a sleek, compact design that fits neatly in your work space. And you've got the color scanner that others will be hard pressed to match.



Both ScanMaker models include either PhotoStyler or Adobe Photosbop, absolutely free.

dthink we'd be satisfied.

"If you need color, we recommend the Microtek MSF-300Z. It's the least expensive full-sized color/gray-scale FOUR MICE RATING 1990 MacUser scanner..."

MacUser September 1990

"...the Microtek MSF-300Z is a clear winner, again, because it comes complete

MACWORLD

and the software is easy to use."

Macworld August 1990

again.

If you need high quality scans of 35mm slides, take a look at the revolutionary ScanMaker 1850.

The first affordable slide scanner for the serious publishing professional.

It offers 24 bit color and 8 bit gray-scale capabilities. And it's also

easy to use. Just drop in a slide and you're ready to start scanning. At resolutions up to 1850 dpi.

And best of all, it costs thousands less than other comparably equipped slide scanners. Which explains why the ScanMaker 1850 is

the logical choice for 35mm slide scanning.



ScanMaker 600Z (PC) \$1,995 ScanMaker 600ZS (Mac) \$2,195 ScanMaker 1850 (PC) \$2,995 ScanMaker 1850S (Mac) \$3,195 If all this weren't enough, both ScanMaker models include the latest image processing software. Enhance, refine and separate your images with

The ScanMaker 1850 scans any 35mm slide for thousands less than other comparable slide scanners. the full version of Adobe Photoshop for the Macintosh or PhotoStyler from

U-Lead Systems for Windows 3.0.

So, whether you're working in black and white or color, with photographs or 35mm slides,

get a ScanMaker scanner from Microtek. We won't be content until you're satisfied.

For information or the name of your nearest dealer, call us at 800-654-4160 or in California.

call 213-321-2121.

MICROTEK Better Images Through Innovation. Color. Speed. Power.



21" SuperMatch™ Two-Page Color Display

Thunder from SuperVlac. Workstation-class graphics performance on your Macintosh!

SuperMac's new Thunder series of 8- and 24-bit accelerated color graphics cards provides you with awesome power that results, as never before, in splitsecond responses on your screen!

Thunder is explosively fast! Its sizzling graphics capabilities are the result of SuperMac's latest achievement in chip design - workstation-class graphics performance on the Macintosh - that's as much as 1000 percent greater than its rivals. So now you can squeeze every ounce of performance out of Aldus PageMaker and Freehand, Adobe Photoshop and Illustrator, QuarkXPress, and other leading programs - and spend your time creating, not waiting.

Thunder supports the widest range of color displays, up to 21 inches in size. It provides pan and zoom in hardware, and a Virtual Desktop™ of up to eight square



Radius card tested with optional accelerator, requiring an additional slot. Comparisons based on results as of July 1991, running Potrero™ Graphics Performance Benchmarks. All tests run on a Macintosh Ilfx in identical configurations. Detailed performance results available upon request.



color graphics cards

feet for poster-size projects. Plus, on-board GWorld memory, for faster manipulation of large color images.

Pathway to the future. Thunder ensures your investment in the future with OpenSlot, SuperMac's exclusive expansion connector. With it, Thunder can be expanded to support your ever-increasing needs for more performance and more functionality. Making it both easy and cost effective for you to upgrade in the future.

Roll like thunder to your nearest authorized reseller to get a blazing-fast test drive today. For the location of the authorized SuperMac reseller nearest you, call (800) 334-3005.



Circle 88 on reader service card

IBM and Apple: What's It All Mean?

How Apple Prepared for the year 2000

BY JERRY BORRELL

e all did it. Tore at our hair, beat our breast,

swore at corporate executives, and expounded on our own interpretation of what it meant for Apple to announce that it will be doing business with IBM. No one can be blamed for that. Apple

Computer has been this country's favorite rags-to-riches saga for 15 years. The company has seemed destined to have a Henry Ford-like influence on America, its role all but defined for PBS documentaries.

But the announcement from the two companies' public relations groups was suspiciously timed, sandwiched as it was between repeated criticism of John Sculley's salary (in Time, Newsweek, Business Week, Fortune, and Forbes) and the announcement of Apple's third-quarter loss of \$53.1 million. It was too easy to think that the announcements were manufactured solely for the purpose of creating a diversion from bad press. Unfortunately, the announcement was so sudden that it harmed the credibility of the official explanations of the development.

For the record, here are the official reasons for Apple's deal with IBM: to share microprocessor technology, to share the development of a company and a future object-based operating system (not the current Macintosh Operating System), to share networking technology, to share multimedia technology, and to plan for future multiplatform computing environments. (In other words, to plan for that elysian time when computers manufactured by several companies will all be able to run the same software.) The unofficial reasons are to

divert the press (as mentioned above) and to teach Microsoft a lesson.

What Does Apple Get?

The thing that left many of us scratching our heads was the question of what precisely did Apple get out of such a deal. You know, the tangible thing. The reason that sent Apple staff knocking at corporate doors in Armonk, New York. What were John Sculley and Mike Spindler actually thinking about?

One answer is found in the need for a new generation of microprocessors. Apple, like most other computer manufacturers, is beholden to the developer of the particular microprocessor that is the heart of its products, Motorola's 68000. Personal computers are based on similar microprocessors made by different manufacturers. Most of us recognize Intel and Motorola, which make the most popular microprocessors. Intel's famous 8086 family of processors and Motorola's 68000 family are classified as CISC chips: complex instruction set computers. But a newer architecture came into vogue some years ago, called RISC, for reduced instruction set computers.

RISC architecture became popular for several reasons, some of which had to do with the business proposition that the technology was available from a source hungrier and cheaper than Intel, Motorola, and others. As a

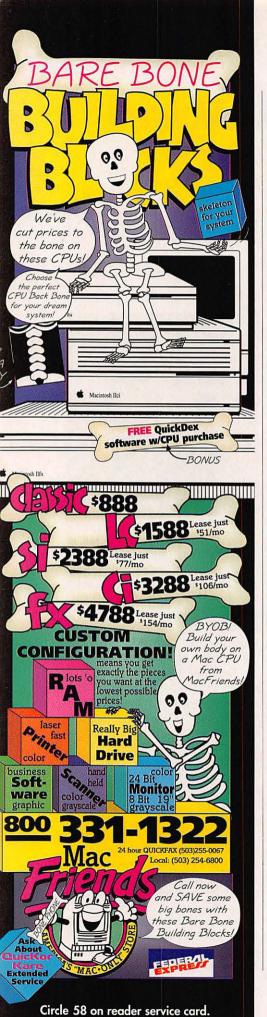


result, a once little (now big) Silicon Valley company called MIPS made a fortune for its founders by licensing RISC microprocessors to companies like Sun Microsystems and Digital Equipment Corporation. (For a great article on this subject, see *Upside* magazine, July 1990, p. 28. You can reach *Upside* at 415/377-0950.)

The most important reason RISC architecture has become popular is that a computer's microprocessor spends most of its time doing the same thing many times. The sets of instructions it processes most of the time are redundant, so a microprocessor built to handle those types of calculations more efficiently, such as a RISC chip, is much faster than a general-purpose microprocessor.

(A brief digression—now there is a shift in the direction of microprocessors toward architectures that are a hybrid of the two approaches, called CRISP, for complex reduced instruction set computers.)

My main point has to do with Apple's belief that the future of its personal computers lies with RISC-(continues)



based technology, and with the ongoing problems that Motorola has had in developing its own RISC processor, called the 88000. The 88000 is generally thought to be no contender against future RISC microprocessors from MIPS, or even from Sun Microsystems (which developed its own

As a result of the Apple-IBM agreement, people buying and using Macintosh technology will get access to better components. It's hard to gripe about that.

RISC microprocessor, called SPARC, some years ago). These issues left Apple executives wondering how the company was going to come up with a generation of much more powerful computers, with 10 to 20 times today's level of performance—not just another miserable 30 percent to 100 percent performance enhancement (as in, Boy, the cursor really comes back fast with an fx!).

Enter IBM-rife with financial woes, a generation of workstations based on IBM's proprietary RISC chip, falling market share in mainframes and personal computers, and publicly asked questions like how IBM can make a return on its technology investments such as semiconductor design and manufacturing. Combine IBM's state with the frame of mind of some Apple executives who are looking at early progress reports on Apple's 88000-based next generation of personal computers, due out in 1992, and a joint agreement begins to make sense.

Now add IBM's complete disclosure of its future RISC releases and deliverable dates from manufacturing (one of which is also timed for 1992). Also add in the stipulation that IBM will allow third parties (Motorola being specifically, but not exclusively, named) to manufacture this line of products under a license agreement,

thereby allowing IBM to make money via royalties. Such an agreement allows Apple to continue doing business with a loyal and capable manufacturing ally, Motorola (which has more experience in mass microprocessor production than IBM). And for the first time Apple will use a microprocessor that can be second-sourced—that is, manufactured by others—perhaps from the onset, thus ensuring that the price of the chips will be lower.

And as a result, people buying and using Macintosh technology will get access to better computers. It's hard to gripe about that.

Will the Mac Go Away?

Does the pope wear white? Apple is planning to introduce a new Apple II! Why would it get rid of the Mac? Apple cannot afford to give up the Macintosh. There is enough work left for improving and evolving the Mac Operating System to keep Apple's engineers working for several years. There will be a constant stream of smaller but powerful revisions of the operating system, and more major changes like 7.0. Apple can plot the next several hardware generations of the Macintosh, too. While it is not clear that the RISC-based computers will be called Macintosh, they will run the Mac Operating System and Macintosh applications.

The Mac will be with us for the remainder of the decade. Every so often, over that period, the oldest generation of Macintoshes will no longer run the latest version of the operating system with all its features. It won't be practical to upgrade older Macs to run the latest hardware and software, and these machines will continue to be used into the late 1990s. But through the next several years, while the microprocessor architecture/ hardware evolution progresses, software evolution will determine how we will use computers toward the end of the decade. And that is what the second part of the IBM-Apple deal is all about.

Sleeping with the Enemy

IBM will not obtain access to the Macintosh Operating System. Instead it will share access to Apple's new op-(continues)

WHEN WAS THE LAST TIME A DRAWING PROGRAM MADE YOUR PALMS SWEAT, YOUR PULSE RACE, AND YOUR HEAD SPIN.



get ready to take the incredible new Canvas 3.0 for a spin. Its exceptional performance and nimble handling make Canvas 3.0 the hottest precision drawing program on the market. And its formidable list of major enhancements puts it miles ahead of anything else on the road. CRUISE INTO THE FUTURE TODAY. Canvas 3.0 is System 7 Savvy with all of the features Apple® wants to see in System 7 graphics applications. Publish & Subscribe, Balloon Help™, AppleEvents™, and 32-bit memory are fully supported. What's more, Canvas 3.0's breakthrough

> Open Architecture technology lets you add new tools, effects and file translators with ease, at any time. IT WILL LEAVE YOU SPEECHLESS. Canvas 3.0 offers a wide range of professional text handling features. Fractional leading and kerning. Tab support within

Effects Macro

text blocks (left, right, center, decimal). Subscript and superscript text. You can even bind text to any curve. Object Layout

Wrap text around or encrust it within irregular shaped objects. Fully justify and slant text margins. Text

Apply character by character font scaling. And convert TrueTvpe™ and PostScript® Type-1 fonts into their Bézier curve outlines.

NOTHING HANDLES CURVES BETTER.

While other drawing programs make you draw Bézier curves by "connecting the dots", Canvas 3.0's freehand tool lets you create any curve by simply drawing it. And it gives you unparalleled Bézier curve editing power -- from multi-point selection and editing to automatic object conversions, combinations, and blends.

You even get centerline auto tracing of scanned images.

GO WHEREVER YOU WANT.

With enhanced color capabilities, including a built-in process (CMYK) color separator, PANTONE® color support, and automatic gradient fills and blends, Canvas

3.0 is blowing the doors off the competition. But it doesn't top out there. You'll also find technical features like custom hatching, parallel lines and curves, and dashed lines, curves and borders. Automatic dimension lines. And a Smart Mouse[™] drawing aide for precise alignments. What's

more, there are new built-in file translators for important multiplatform formats like EPSF, TIFF, CGM, DFX™, IGES, and Illustrator®. TAKE THE CHECKERED FLAG. Why drive some sedate sedan when you can own the road with the new Canvas 3.0.? It's incredibly easy to use -and the list price of just \$399 simply adds to the thrill. So, take a deep

breath. Buckle up. Double click. And unleash the awesome power of Canvas 3.0. You're in for the ride of your life.

TIRED OF YOUR OLD SEDATE SEDAN? Well, trade-in any used model of MacDraw®, MacDraft®, Illustrator® or Freehand™ for a brand new Canvas 3.0 dream machine for only \$149.00. Mail your original

program disk with payment to our main address below. Include your MC, VISA or Amex card number, account name and expiration date, or a check in US

dollars drawn on a US bank. Add \$10.00 shipping. Offer valid in the United States and

Canada. Expires on 12/31/91. Please

allow four to six weeks for delivery.

For more information or the name of your nearest dealer call (305) 594-6965 or Fax: (305) 447-5794. ©1991 Deneba Systems, Inc., CanvasTM and Smart MouseTM are trademarks of Deneba Systems, Inc., MacDraw® is a registered trademark of Garis Corporation. Truelypes, Bolloon HelpTM and AppleEventsTM are trademarks of Apple Computer, Inc. PostScript® and Illustrator® are registered trademarks of Adobe Systems Incorporated. MacDraft® is a registered trademark of Innovative Data Design, Inc., FreehandTM is a trademark of Addus Corporation, PANTONE® is a registered trademark of Pantone, Inc., DXF is a trademark of AutoObsk Inc. The F-40 illustration was created and color separated using Canvas 3.0. We welcome environmentally sound ideas on what to do with tens of thousands of pre-owned master disks.



Technical Publishing for the Macintosh



Textures is a sophisticated system ideally suited to the design and production of technical publications, including books, reports, and manuals. Based on Tex, the sine qua non of technical typesetting, Textures offers a fully programmable automatic publishing system, with rich mathematical and symbolic notation, cross-referencing, automatic numbering, floating illustrations, facilities to construct complex tables, bibliographies, and indices, as well as the finest available typography. Graphics, illustrations, and photographs can be incorporated; finished materials can be transferred to other applications, or sent directly to draft and high-resolution printers. Classic Textures includes a multiple-document editor, precise screen display, and a full set of PostScript fonts for technical and mathematical material. If you are a publishing specialist, or have an interest in high-end publishing tools, you should be aware of Textures. The price is \$695, academic \$495; satisfaction is guaranteed.

Blue Sky Research ■ 800 622 8398 ■ 503 222 9571 ■ fax 503 222 1643

Circle 14 on reader service card.

erating system based on object-oriented programming (OOP) techniques. The form of this sharing is to be a jointly established company that will deliver a new operating system to Apple, IBM, and other companies who want to license it.

My initial reaction to the announcement was wanting to ask the press-release writers to cut us some slack. Apple can't form a software business (Claris) successfully, let alone go into a jointly operated business with IBM. And even if a company is formed, the concept is dumbfounding. A group of senior software engineers from both companies will sit around and amicably discuss how to get product out? More likely, battles will begin from day one, and at best, the joint company might become two camps battling over niggling points of direction.

That minor point aside, the substance of the Apple-IBM agreement revolves around the theory that the industry needs common ground for an operating system so that computers, applications, and data can be shared across all computers. This discussion is driven by large businesses that influence people such as John Sculley. It was popularized by Bill Gates. When computer-company leaders succumb to this siren's song, they inevitably begin mumbling about cross-platform compatibility. Businesses find it more profitable to work with older, stable, depreciated, but antiquated computer technology. So they use their financial clout to suggest that computer manufacturers should get together and solve problems by creating one unified approach to operating systems.

Those who propose this choose to ignore the experience of personal computer manufacturers in Japan with MSX, a unified operating system that was supposed to help businesses by allowing all applications to run across all platforms. The idea was that companies would compete based on their hardware. But the MSX effort failed, despite government support.

Proponents of a standard, crossplatform OS must believe that Unix, which after two decades of standardization is a worse mess than ever, is a flawed model too. (Perhaps they be-(continues)



Fax interruption in progress.

Wouldn't you know it, just when you start to get some work done, the fax machine jerks you away from your Mac. And on most days, it happens time and time again.

That's why we introduced COMstation fax/data modems. So you could be far more productive—without ever leaving your desk.

COMstations work through your Mac to let you send and receive faxes directly—at 9600 bps—to and from virtually any other fax machine in the world.

Send faxes from within any application to groups, distribution lists, or single individuals, by clicking on icons. Receive faxes in the background automatically—without interrupting your work. Automatic redialing saves you time on days when the telephone lines seem to be forever busy. And scheduling options let you take advantage of lower phone rates.

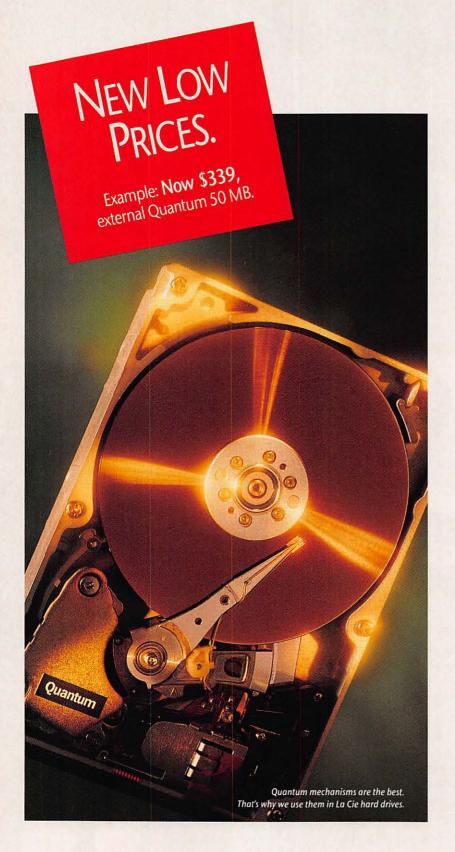
What's more, the affordable COMstation ONE includes a 2400 bps Hayes—compatible modem for file transfers and on—line services. And the speedy COMstation TWO adds V.42, V.42bis, V.23, and MNP5 to increase effective data throughput to 9600 bps.

So the choice is yours. You can pop up and down all day long...or get yourself a COMstation fax/data modem. The sooner you do, the sooner you can kiss those fax interruptions good-bye.

Call PSI at 1-800-622-1722 for the name and address of the dealer nearest you.



PSI Integration, Inc. 851 East Hamilton Avenue, Suite 200 Campbell, California 95008 COMstation ONE, COMstation TWO, the PSI logo, and "Communications made easy" are trademarks of PSI Integration, Inc. Other brand names and product names are trademarks or registered trademarks of their respective companies. For the name of a PSI International Distributor call (408) 559-8544



Tsunami, Silverlining, La Cie and the La Cie Ltd. logo are trademarks of La Cie, Ltd., a Plus Development Company. All other trademarks are the property of their respective owners. All prices, specifications, terms, and descriptions of products and services herein are subject to change without notice or recourse. La Cie, Ltd. 19552 SW 90th Court, Tualatin, OR 97062. Phone (503) 691-0771, Fax (503) 692-8289. © La Cie, Ltd. 1991 All rights reserved. Printed in U.S.A.

SIX REASONS WHY LA CIF HARD DRIVES ARE THE BEST YOU CAN BUY

A Quantum Difference.

Quantum drive mechanisms offer blazingfast effective access time as low as 8 milliseconds.* No other drive mechanisms in their class (Mac*compatible) run faster, which is why they are in La Cie drives.**

Typical application access time using 64KB DisCache.

**Seagate drive mechanisms also available (capacities from 300MB to 1.2GB).

Software with a Silverlining.

Every La Cie drive includes a FREE copy of Silverlining, the #1-rated hard drive management utilities program.

Silverlining drivers can get 30% more speed from a drive than the competition. It works with any true SCSI drive, internal or external. So one program can manage it all. Plus,



MacUser says, "Silverlining is one of the most powerful and useful hard disk utilities you can find—most Apple engineers prefer it to Apple's own."

Silverlining optimizes your data so it's consecutive on your drive, which makes your applications run faster.

And, Silverlining drivers are intelligent. They test the drives' functionality at startup to ensure that everything is working properly. If it's not, it protects you.

For even more protection, every La Cie drive includes a FREE copy of Norton Utilities® for the Macintosh. It automatically diagnoses, reports and repairs common and dangerous disk problems. Silverlining and Norton Utilities are regularly priced at \$149 each. So, you get software worth almost \$300—ABSOLUTELY FREE— when you buy a La Cie drive!

3

A Company You Can Count On.

La Cie is a Plus Development Company (makers of the Hardcard* XL), backed by \$400 million in assets. That means you can trust La Cie to provide a constant source of high-quality mechanisms and components. And you can be certain that we'll be around to help you with service and support. For a long, long time.



The Most Unusual Warranty in the Business.

La Cie features a RENEWABLE 2-YEAR LIMITED
WARRANTY.† If anything goes wrong with your La Cie Quantum

drive within two years, we'll repair or replace it within 48 hours—and then renew your warranty for another 2 years. Free of charge!

Every La Cie drive is backed by toll-free support from customer service and technical assistance experts.

†Restrictions apply. Please contact La Cie for complete warranty information.



Award-Winning Design.



Hard drives that win design awards? Who says intelligence has to be ugly? The Tsunami and Cirrus hard drives have received prestigious awards from both the industrial design and computer communities.

La Cie drives are designed from the inside out. Designed to be quiet (with a ½ speed fan), light-weight (as light as 2½ lbs.), durable and reliable. Plus, they have an external termination and SCSI address switch, which means you'll never have to open the case for any reason! You don't win awards for these features, but you do win a loyal following.



Rave Reviews from Critics and Customers.

Frankly, there's been a lot of talk about La Cie hard drives. Leading Macintosh consumer magazines praise us. Customers write us fan letters. In fact, we're happy to let critics and customers have the last word about La Cie drives. Because they tend to be words like these:

★ははは ★ MacUser

... "The Good Housekeeping Seal. I'm now taking the safer course of buying from corporate-owned companies such as Quantumbacked La Cie..."—MacWeek



La Cie offers internal and external hard drives from 40MB to 1.2 Gigabytes. Choose from the award-winning Tsunami, Cirrus, ZFP Family and Internal drives. Plus, La Cie now offers the Bacster, a hard drive that attaches directly to the back of a Macintosh Plus or SE.

\$299

To order or for more information, call toll-free 800-999-0143.

Volume discounts available.



Circle 197 on reader service card



with PowerDraw, accepted worldwide as the professional 2D CAD standard for the Macintosh. Fast. Intuitive. Elegant.



For free brochure, call Engineered Software. 1-919-299-4843. In Canada, call Evoy & Associates. 1-204-453-8111.

Circle 12 on reader service card.

There's A New Tris On The Block.

If you love TETRIS, you'll be obsessed with WORDTRIS™! In this new Soviet challenge, the falling pieces are letter blocks, and instead of just forming lines, you make words.

Every time a word is formed either vertically or horizontally, it disappears. The more words you make, and the more complex the words, the more points you earn. A built-in 30,000 word dictionary checks even the most obscure word.

But the real challenge builds as the levels go higher and the letters fall faster and faster.

WORDTRIS. Let the alphabetical adrenalin flow!

FROM THE TETRIS™ PEOPLE

Spectrum HoloByte

A Division of Sphere, Inc., 2061 Challenger Drive, Alameda, CA 94501
Available for Mac/Mac II and IBM

Available In retail stores or for Visa/MasterCard orders call toll free, 24 hours a day, 7 days a week: 1-800-695-GAME (Orders Only)
For technical questions and system requirements call: 1-415-522-1164 (M-F: 9am-5pm PST)

Circle 214 on reader service card.

lieve the Unix experience can be avoided by good planning.) Similarly the implementation of Motif, a common interface developed by a consortium of nearly two dozen computer companies, is a flawed model.

And finally the proponents will have to hope that IBM working with Apple—even if successful—will not be like IBM's deal with Microsoft, in which IBM adopted Microsoft's operating-system technology and was then led about for years by Bill Gates.

So What?

I agree with those who say that the metaphor of personal computing will change by decade's end. I believe that there is likely to be another advance in technology, like the Mac, that is different from all that came before it. And I agree, as a manager in a business, that stability in computing

I don't think that
the next great advances
in computer operating
systems will come
from a consortium

would help my business to avoid unnecessary expenses in the near term.

But I don't think that the next great advances in computer operating systems will come from a consortium. I don't think that a socialistic approach to development (from each according to his programming ability, to each according to his hardware need) is how the computer industry is going to advance. Or we'd be buying computers from Moscow. And if I think like a standard business manager and push for cross-platform compatibility, I'll lose my shirt to Japanese competitors in the next decade.

Apple is an independent company. It can remain so. Whether its citations in PBS programs of the future will be history lessons or a current profile will depend upon whether Apple's leaders see that leadership starts at home, not at committee meetings.

WOR

For MACWORLD Subscribers VES! Please send me a year (12 issues) of MACWORLD for only \$24. That's almost 50% off the annual cover price of \$47.40.

NAME

ADDRESS

CITY / STATE / ZIP

Please bill me. Payment enclosed.

Allow 4 to 6 weeks for delivery. Basic subscription price is \$30 for 12 issues. The annual cover price is \$3.95 per issue, \$47.40 annually. For Mexican subscriptions, please add \$18 per year for shipping. For Canadian subscriptions, add \$18 plus \$1.68 (7% GST). Add \$70 annually for all other foreign countries.

4BCE8

Subscribe today and SAVE \$23.40



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1167 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

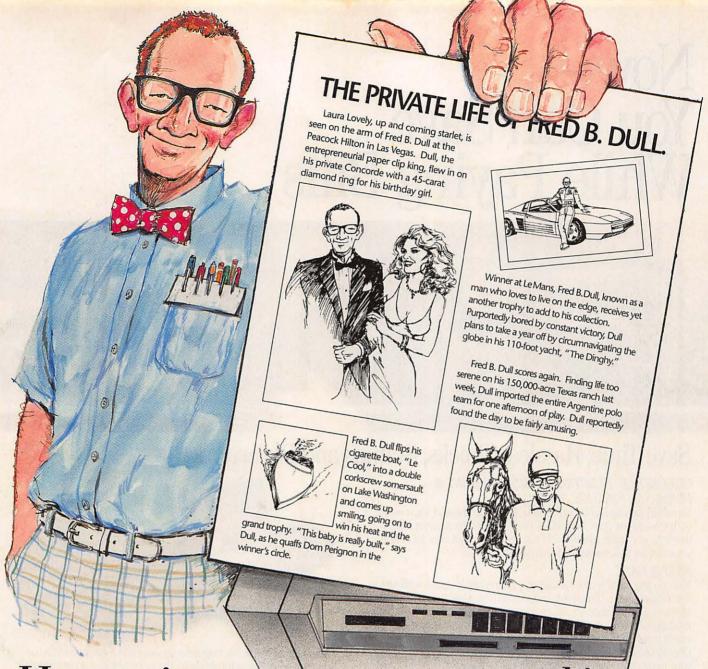
Haddlandladdadladddalladdadladadl

MACWORLD

Subscription Department P.O. Box 51666 Boulder, CO 80321-1666 NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

Detach and mail today!

Don't let this card get away...



How to improve your personal image.

Introducing the new TurboPS Personal Series laser printers.

Take it from Fred B. Dull. With NewGen™ TurboPS Personal Series printers, your documents will look amazingly crisp, clean and professional.

With our new line of personal PostScript@compatible printers.

you can greatly enhance images beyond your wildest imagination. The TurboPS/400p™ (400 dpi) and the TurboPS/300p™ (300 dpi), both offer the convenience and compactness of a personal printer. And proprietary features the competition can't touch.

Resolution close up, 13 point Courier enlarged 500%

TurboPS/400p, to smooth characters, lines and curves. And Automatic Recognition Technology (ART)™ that smartly selects

res the competition can't touch.

TurboPS/300p

Wit

Like Image Enhancement Technology (IET), standard on the

NewGen, NewGen Systems Corporation, NewGen logo, TurboPS/300p, TurboPS/400p, Image Enhancement Technology (IET) and Auto Recognition Technology (ART) are trademarks of NewGen Systems Corporation. PostScript is a registered trademark of Adobe Systems, Inc.

interfaces and emulations without operator intervention.

A second paper tray, memory cards, SCSI interface and other I/O expansions are among the options when you're ready to upgrade.

All this at a surprisingly low price.

To learn more, or for your nearest Authorized Dealer, contact NewGen today. The NewGen TurboPS Personal Series laser printers. If they can do this much for Fred B. Dull, just think what they can do for you.

See us at Seybold Booth #2742



Dealer inquiries welcome.



NewGen Systems Corporation

California Sales Office: 17580 Newhope Street, Fountain Valley, CA 92708 Telephone (714) 436-5100 FAX (714) 641-2800

Minnesota Sales Office: Telephone (612) 942-5665 FAX (612) 942-5923 Toll Free 1-(800)-879-4639

End users circle 244 on reader service card Dealers circle 246 on reader service

Now-You Can Save While Paying Bills



Save Time, Hassles, Checks, Stamps and Paperwork

CHECKFREE: ELECTRONIC BILL PAYMENT & PERSONAL FINANCE SOFTWARE

Make bill paying and record keeping faster and easier than ever with CheckFree from Checkfree Corporation, the nation's leader in electronic payments. CheckFree processes well over \$2 billion annually for businesses and individuals.

FAST & EASY

You can pay all of your bills and do your record keeping with just a few mouse clicks. You simply indicate who you want paid, the amount, and the date. Fixed, recurring bills (such as your mortgage) can be paid automatically. Your software records, categorizes and sends the information via modem to the CheckFree Processing Center. Then, CheckFree completes your payments.

ANY BILL, ANY BANK, ANY CHECKING ACCOUNT

With CheckFree, you don't have to switch banks and you can pay virtually any individual or company in the U.S. Your payments will be cleared through the U.S. Federal Reserve System, the same system banks use. Many payments can be sent electronically from your account to the account of the party you are paying If not, a laser-printed draft or check is sent.

VERIFICATION & DOCUMENTATION

Transactions are verified and automatically recorded by the software. Plus, they are documented in your bank statement. Non-CheckFree transactions can easily be entered. And, you can export data to MacInTax® and Excel.®

AVAILABLE WITH...

CheckFree's electronic bill payment system is integrated in Quicken® and Managing Your Money.® So, you can enjoy CheckFree with these programs, too!

THE EXPERTS SAY ...

"For me, CheckFree simplifies the entire bill paying process." Not only do I avoid paperwork, but I can pay my bills at my

Hardware Requirements: Apple MacIntosh® 512KE or higher, 800K drive—and a Hayes® compatible modem. CheckFree is a registered trademark of Checkfree Corporation. All other trademarks are the property of their respective corporations.

 Money back guarantee on software valid for direct orders only; return within 90 days of purchase for a full refund. Lawrence J. Magid, @1989 Los Angeles Syndicate. Reprinted with permission.

PC Computing reprinted from PC Computing. November, 1990. @1990, Ziff Davis Publishing Company



order dealers incuding Egghead Discount Software,® Electronics Boutique,® Babbages,® Waldensoftware, Software Etc., CompUSA, MacConnection, and MacWarehouse

CheckFree® software is available

convenience. When you take into account the money you save on postage and check printing costs, the price of CheckFree service is reasonable.

-Lawrence Magid, L.A. Times

"...unless you thrive on the satisfying thump of a stack of envelopes hitting the bottom of the mailbox...you're going to enjoy using CheckFree. It saves time, money and aggravation."

-Chris Shipley, PC Computing

FIRST MONTH OF SERVICE FREE

CheckFree software is available at retail stores or by phone for only \$29.95 (plus \$4 for shipping and handling). Your first month of service is FREE. So, you can try it without obligation. After that, its \$9.95 per month for your first 20 payments (and \$3.50 for each additional set of 10 payments or portion thereof).

RISK-FREE INTRODUCTORY OFFER

Try CheckFree for 90 days. If you don't agree it's a faster and easier way to pay your bills, return your confirmation letter and we'll refund all service fees and the cost of the software.*





LETTERS

For Sole

Quitting Macintosh Motoring

In the late sixties and early seventies, British motorcycles dominated my life. When you got up in the morning, you never knew if they were going to start, but when they did, the ride was incredible.

Today, I spend my time kick-starting a Macintosh, and as with the British motorcycle, you never know when the plugs are going to foul and the Mac simply won't run. Rather than fix the problems with the Macintosh Operating System, Apple made a new one, with even more problems than the first. I have done just about everything but overhaul the motherboard, and the Mac still doesn't run smoothly.

I gave up on British motorcycles. System 7 has convinced me it is time to do the same with my Macintosh. This Mac is up for sale and I am walking away. Robert Irwin Lynden, Washington

Emphatically Not Yet

Y our two-word review of System 7 is "emphatically yes" ["Confessions of a System 7 User," July 1991], but after reading the article, I don't see what the excitement is about. Anyone who uses the Macintosh daily doesn't need more crashes or a system that is ahead of the software that runs on it. This Macintosh user will wait until the thrill seekers have done the debugging and the developers have come up with software that recognizes System 7.

Richard Harrison Portland, Oregon

Incompatible System 7 Review

found your coverage of System 7 in the July 1991 issue to be quite inadequate. I expected some down-to-earth information from Jim Heid's how-to article, "Getting Started with System 7." I knew I was going to be disappointed when I read the words, "I discovered remarkably few incompatibilities."

My compatibility-check report found that three of my applications were compatible, five were mostly compatible, though two of those had newer versions that were recommended, and ten applications I had to upgrade.

Lowell Erickson Granada Hills, California

The Speed of Compact Pro

avid Pogue states that StuffIt Deluxe 2.0 [Reviews, July 1991] is "even generally faster than Compact Pro." From testing various file types, I found that StuffIt Deluxe's Best Guess compression is usually within 1 percent of the file size of Compact Pro's compression scheme. For this equivalent compression, Compact Pro was, on average, more than twice as fast as StuffIt Deluxe.

Ken Hancock Waltham, Massachusetts

Lite Desktop Publishing

was quite dismayed to read Jerry Borrell's article [Commentary, July 1991]. Your readers don't need 90MB image files, gigabyte drives, or even a copy of Photoshop to produce quality color from the desktop. What they do need is an adequate level of training on color-printing technology and a good OPI [Open Prepress Interface] service bureau.

Corrections

The résumé software from Individual Software (Window Shopping, July 1991) is called ResumeMaker.

The Gravis MouseStick (Best Sellers Product Watch, August 1991) is made by Advanced Gravis Computer Technology.

The correct phone number for Nanao USA Corporation (Where to Buy, August 1991) is 213/325-5202.

The actual results for the Mobius Accelerator ("The Accelerated Course," July 1991) were faster than portrayed in the "Speed Tests." The Mobius should have been positioned among the MacProducts, NewLife, and Total Systems 25MHz accelerators in overall performance.

Borrell complained about the storage costs. You could get all the scans for an entire magazine on one \$3 8mm tape. Why archive on expensive hard drives?

Jerry Jewell Rancho Cordova, California

Information Slavery

Prior to reading "How the Good Guys Finally Won" [The Iconoclast, June 1991], I was only vaguely familiar with Lotus's reasoning for abandoning Marketplace. I am pleased (continues) that this product was pulled because, "flawed [public] perception" or not, this type of product has abuse written all over it. What really amazes me is that Lotus and Equifax stood to make big bucks from this product while the people who supplied the information, namely us, would get nothing.

David Oliver Springfield, Virginia

Information Monopoly

The people who won in the withdrawal of Lotus Marketplace were the reactionaries in a small segment of our society. This vocal group has helped those who already have access to this information keep a lock on it, thereby creating the likelihood that abuse of this privilege will happen in the future.

Being on a computer list and being a target market is part of our system. I choose to participate in our society, and I am glad others feel they have something to say to me.

Mark Cline Birmingham, Alabama

How to Double Data Loss

A friend recently showed me a review [in *Chicago Computing*, September 1989] of a device called the DoubleDisk Converter.

The Converter is essentially a precision hole punch designed to produce the extra hole in the double-density floppy-disk case that allows the Macintosh to format and run the disk as a 1.4-megabyte high-density disk. The reviewer claims that all major disk

manufacturers produce double-sided disks that meet the minimum ANSI coercivity standard of 600 oersteds for high-density drives. On this argument, a double-sided disk should function quite well as a high-density disk. What do you make of these claims? Charles Rootbaan Chicago, Illinois

According to Bay Area disk manufacturer Dysan, the coercivity spec for double-density (800K) disks is indeed 600 oersteds, but for high-density (1.4MB) disks, it is 720 oersteds. Reformatting double-density disks and using them as high-density disks is like stuffing yourself into a too-tight pair of jeans: it can be done, but something may give way. See *Quick Tips* in this issue for more information.—Ed.

No Word on ROM Upgrades

A pple advertised and documented the Macintosh II, IIx, IIcx, and SE/30 as having the capability to address as much as 128MB of memory, an amount that should be sufficient for most users many years into the future. In addition, Apple has the foresight to manufacture their System ROMs [for these machines] on SIMMs, to allow these machines to easily upgrade their System ROMs.

The current System ROMs are not "32-bit clean." Users of these Macintosh machines are limited to 16MB, and even less after the addition of expansion cards.

We the users, owners, and administrators of these Mac computers would like

How to be social.

Think how much more effective your people would be if they could communicate better. That's the idea behind WordPerfect Office 3.0 for the Macintosh.

It's actually several programs in one.

WordPerfect Office comes with a very versatile E-mail package (WordPerfect Office Mail"), that makes it easy for people on a

Macintosh network to keep in touch. The mail screen shows you everything you need to compose and circulate messages to an individual, to a group, or to the entire corporation.

With Mail, not only can you send and receive messages, but you can also attach up to 100 files of any format. Beyond that, you can add sound or voice annotation, broadcast

a message to anyone logged onto your network, or send carbon and blind copies.

Ever wish you could take back your words? Mail's unique status tracking capabilities let you know when a message has been delivered or opened. So if a message hasn't been read yet, you can retract and edit it.



to see Apple make a public statement regarding its plans to make a ROM upgrade available.

Adam Engst, Jim Gaynor, Tonya Joy Byard, Jeffry Hexter, John Lawson, [followed by 567 signatures from all over the world]

See MacBulletin, August 1991, for news on the available alternatives to ROM upgrades for 32-bit addressing.—Ed.

Hazards of Recycled Paper

Trees are a renewable resource; they do grow with sunshine and water. Paper is safer for the environment before it becomes a chemically hazardous sludge during the recycling process. The solvents used to remove the old inks and copier toner, plus the repulping (shredding),

leave only about 20 percent of the recycled paper usable. The remaining [material] must be dumped as a hazard.

Lee Holmes Sacramento, California

According to Jeff Rabuck of Earth Care Paper of Madison, Wisconsin, diffusing ink into the recycled paper product and bleaching without chlorine are methods that limit the release of petroleum-based inks into the environment as a by-product of recycling, and only 20 percent of the paper at most being recycled is wasted. Macworld is exploring with our printer the use of recycled paper and soy-based inks in the production of the magazine, but unfortunately the quality of the products does not allow us to change over at this time. On another front, Macworld is working on electronic publishing alternatives that may reduce our reliance on paper and ink.—Ed.

Subscription Sabotage?

Please note that the December 1990 Macworld arrived only this week [May 10, 1991]. I realize that there was a war in this area and that we had many days and nights of Scud attacks and air[craft] flying over on bombing raids of Iraq, most of which interrupted my sleep, reading Macworld, and computing, but it shouldn't have interrupted my subscription service.

I [further] request that you take into account the following points: 800 telephone numbers do not work from most overseas locations to the U.S. I suggest you require advertisers to add fax numbers to all

ads. Foreign residents also encounter difficulty in obtaining updates to software. I've been trying to update software without success and am mad about poor dealer service [abroad]. Ward E. Whitley Dhabran, Saudi Arabia

Steamed Subscriber

his spring I renewed my subscription to Macworld by returning one of the renewal cards I received in the mail. I recall having mailed this sometime in mid-April. By mid-May I had become a deadbeat. I was guilty of nonpayment of my renewed Macworld subscription. No simple invoice, but a letter stating my name was being placed in a bad-debt file and my account was being turned (continues)

How to get a date.

Of course, open communication is only one of many ways to bring people together. That's why WordPerfect Office 3.0 for the Macintosh also offers an integrated calendar and network scheduler to help you make appointments, coordinate meetings, schedule events and company resources as

well as make to-do lists.

Along with WordPerfect Scheduler and Calendar, WordPerfect Office includes other useful desktop utilities such as Notebook, a flat-file database program; File Manager to help you organize your files; and Forms Maker to create custom forms for Mail.

Notebook, and Calendar.

Want to know more about WordPerfect Office 3.0 for the Macintosh? That's easy, too. Just call us at (800) 526-2252. It could be the start of a very productive relationship.

WordPerfect

WordPerfect Office 3.0 For the Macintosh

WordPerfect Corporation 1555 North Technology Way, Orem, Utah 84057 Tel: (801) 222-5800 FAX: (801) 222-5977. WordPerfect is a registered trademark, WordPerfect Office: and WordPerfect Office Mail are trademarks of WordPerfect Corporation in the United States and other countries. All other brand and product names are trademarks or registered trademarks of their respective companies. Selection of the WordPerfect Corporation.



over to a collection agency! The tone of the letter seemed to indicate that these actions would be taken regardless of whether or not I paid.

I protest this form of consumer abuse. Your credibility has been damaged. The next article concerning consumer rights or market fairness by you will be met with considerable suspicion.

Tom Schneider Chicago, Illinois

According to our records, Tom Schneider mailed a renewal notice on February 19, 1991. Macworld mailed three bills over the next three months requesting payment. When we received no payment, a fourth bill, referred to in his letter, was mailed in late May. Like Time, Newsweek, and many other maga-

zines, Macworld uses a collection agency for delinquent subscription payments. Unfortunately, we couldn't know that Mr. Schneider had not received his first three bills. Our apologies to him for any concern about his credit rating, which has not been damaged.

Finally, some readers seem confused about direct-mail solicitations that offer a free issue to new subscribers. If you accept the offer but then ignore the bill, we assume you want to subscribe but have postponed payment. You must write "cancel" across the bill and return it if you don't want to receive future issues or bills. To resolve subscription problems, call 800/288-6848 or 303/447-9330.—Ed.

Electronic Censorship

lectronic speech may be omnipresent, but how far is it protected? The U.S.

Freedom of Information Act has failed to keep pace with the demands of new technology. The rules of access remain obscure. Fears have also arisen that commercial interests may soon be able to corner the market in data distribution, setting the price for information that should be available to evervone. How [do we] define electronic privacy when the FBI is unashamedly eavesdropping on electronic bulletin boards?

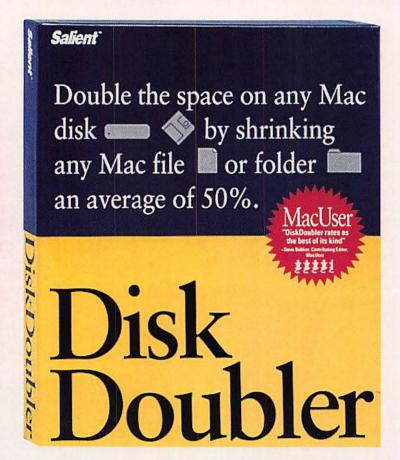
Senator Bob Packwood and legal scholar Laurence Tribe have both proposed constitutional amendments extending the Bill of Rights to electronic media. Organizations have been set up to explore the legal and moral boundaries of the computer world.

Until these questions

are answered, cyberspace will remain, in the words of John Perry Barlow, "vast, unmapped, culturally and legally ambiguous, and up for grabs."

Philip Spender Publisher, Index on Censorship London, England

Letters should be mailed to Letters, Macworld, 501 Second St., San Francisco, CA 94107, or sent electronically to CompuServe (70370,702), MCI Mail (294-8078), America Online (Macworld) or AppleLink (Macworld1). Include a return address and a daytime telephone number. We regret that, due to the high volume of mail received, we're unable to respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of Macworld.





Free Millions for \$79.95.

Reclaim megabytes of disk space with DiskDoubler.

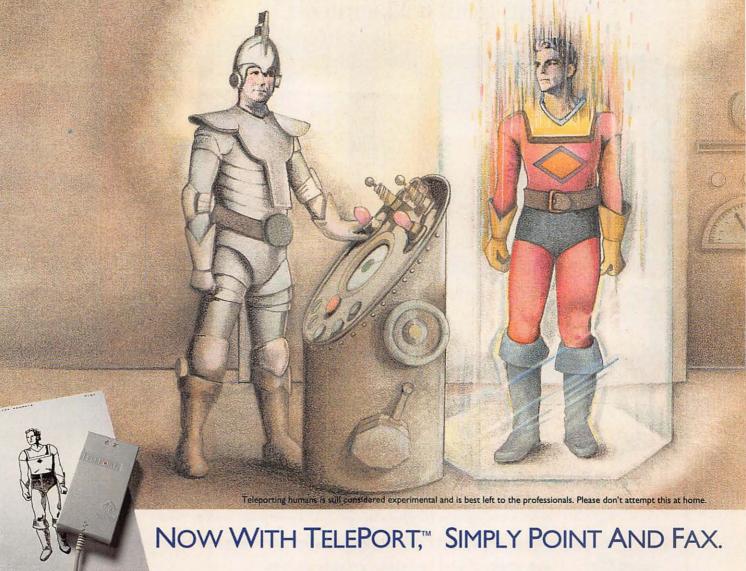
Available at leading software stores.

Salient Software, Inc., 124 University Avenue, Palo Alto, CA 94301 (415) 321-5375.

DiskDoubler is a trademark of Salient Software, Inc. @ 1990, 1991.

Circle 39 on reader service card

TELEPORTING THE OLD WAY.



'30's, a handful of visionaries began tinkering with the idea of teleporting. These futuristic few were exploring ways of putting people in contact with other people. Anywhere on earth.

Back in the

We're still working on teleporting humans. But thanks to a group of futurists at Global Village, the vision of people-to-people contact has been realized with the TelePort family of products.

TelePort/Fax connects your Macintosh® at 9600 baud to over 20 million fax machines and includes a 2400 baud MNP5 modem. You can fax your ideas from any application to anywhere in the world just by holding down your option key as you drag down from FILE to FAX.

Advanced engineering and elegant design make *TelePort/Fax* quite possibly the easiest-to-use modem ever. There's no power supply to hassle with. Simply plug it into your keyboard port and point and fax. Its sophisticated software dials the fax number for you and enables *TelePort/Fax* to work silently in the background while you work on other tasks.

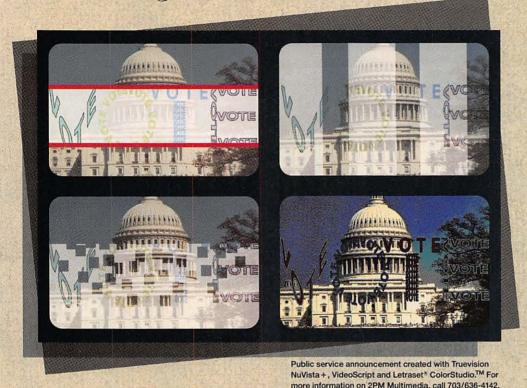
And not only does *TelePort/Fax* connect you with other people, but it

hooks you up with the folks at Global Village, a group dedicated to delivering complete fax solutions at reasonable prices. Our no-hassle, on-line registration makes it easy for us to provide you with the best support possible. To get the facts on our fax, call us at 1-800-736-4821 or 415-329-0700 internationally.



GLOBAL VILLAGE

"With Truevision NuVista*+ and VideoScript," we produce broadcast commercials straight from a Macintosh."



Now you can script and produce professional videos on your

Macintosh using VideoScript software with any Truevision NuVista + or NuVista graphics engine. With VideoScript, you create a series of 'events' by defining duration and speed for transitions between graphics and video. The VideoScript interface lets you quickly master the basic transitions, yet allows access to more sophisticated effects for truly dazzling video productions.

Special effects for live video include capture, strobe and posterization.

There are 28 transitions (wipes, pushes, reveals and blends) with selectable borders and border colors. And unlike other programs, these transitions all run at 16 bits/pixel for the highest quality real-time effects available on a Macintosh.

Truevision is well known in the broadcast industry for providing the highest quality video output. With VideoScript, you can make the most of the advanced features of the Truevision NuVista + . Improve the quality of *your* video output by using this powerful combination in your next production.



Circle 38 on reader service card

INTERNATIONAL: Canada 416/940-8727 France 33-1-3-952-6253 Italy 39-2-242-4551
U.K. 44-628-77-7800 West Germany 49-89-612-0010 Other international 617 / 229-6900

*Order any model NuVista+ by July 15, 1991 and receive VideoScript at no extra cost (U.S. domestic offer). International offer extends through August 1, 1991. Letraset is a registered trademark and ColorStudio is a trademark of Letraset.



James and Charles Wine 2PM Multimedia Linden, VA

"Right now, vider is getting hot on the Mac.
Truevision has been in the broadcast field for years, and that counts for a lot."

Call 800-858-TRU

All things being equal, they're not.

They're just about the same price. They're made by two very good

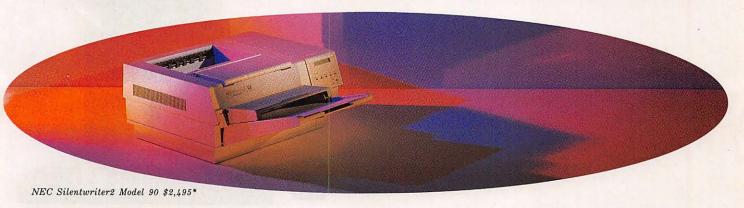


Apple Personal LaserWriter NT. \$2,599*

companies. Yet, there's one thing that makes NEC's

Silentwriter® 2 Model 90 look much better on paper
than the Apple Personal LaserWriter® NT. It prints

your work up to 50% faster. Pretty amazing, considering all the other great



things NEC's Silentwriter2 Model 90 can do. Of course, it's completely Mac and MS/DOS compatible. It also has screen fonts, a standard 2MB of memory, the ability to do envelopes and it prints the richest blacks you've ever seen.

But, most importantly, the Silentwriter2 Model 90 comes with Adobe® PostScript®. So whether you're printing newsletters or flyers, sales sheets, stationery or shareholders' reports, you'll have thirty-five different typefaces to help you create the most dazzling documents possible. For product literature, call 1-800-NEC-INFO. NEC's Silentwriter2 Model 90.

Take a close look and you'll find it has no equal.





IBM believes these computers But only until

Trade in your old Apple® and COMPAQ.® Trade up to PS/2.®

Thanks to IBM, your old Apple and COMPAQ computers—even your IBM computers—can do more for you now than ever before.

Through December 31, you can redeem specific COMPAQ and Apple models, such as the DESKPRO® 286e and Macintosh® SE, for up to \$1,250 toward the purchase of the latest generation of IBM PS/2s, including i386™ SX and i486™ SX models. So PS/2 computers have never been more affordable.

For example, if you trade in your DESKPRO 286e with a color monitor, you can get up to \$850 toward the purchase of the world's best-selling 386 SX

personal computer, IBM's PS/2 Model 55 SX.

If you already own an IBM computer, there's never been a better time to upgrade. Because you can also trade in specific IBM PS/2 and PC models toward IBM's newest PS/2s. Then you'll know what people have known for years—an IBM computer retains its value exceptionally well.

And now more than ever, you'll realize the redeeming value of an Apple or COMPAQ computer it can help you buy a PS/2. Contact your IBM Authorized Remarketer or call 1 800 272-3438, ext. 386 for the remarketer nearest you.

IBM and PS/2 are registered trademarks of International Business Machines Corporation. 386 and 486 are trademarks of Intel Corp All other products are trademarks of their respective companies. ©1991 IBM Corp.



have some redeeming value. January 1.



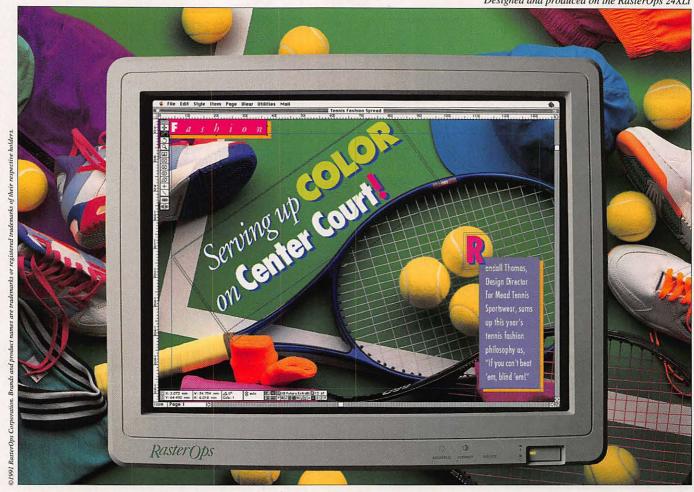






How're you going to do it? PS/2 it!





INTRODUCING RASTEROPS' TEAM OF 21" GRAPHICS SYSTEMS. GAME. SET. MATCH.

RasterOps' new two-page 21" graphics systems offer the precision, speed, and high performance you've come to expect from the leader in color technology. From photorealistic imagery to video capture and graphics acceleration, our five new systems offer everything you need for winning graphic design.

The RasterOps® 8XLi and 24XLi bring graphic design to new heights. Both offer two full pages of text and graphics with on-board

acceleration. What's more, the 8XLi can quickly and easily be upgraded to 24-bit color with the VRAM expansion kit. It's designed to protect your hardware investment by providing the ultimate in flexibility.

24-BIT COLOR 24XLTV, with live video and built-on acceleration 24XLi, with built-on acceleration 8-BIT COLOR 8XLi, with 24-bit upgrade 8XL, affordable 8-bit solution GRAY SCALE ClearVue/GSXL, for business productivity

MONOCHROME ClearVue/XL, the low cost,

high resolution system

The RasterOps 24XLTV offers the same 24-bit True Color brilliance and on-board acceleration of the 24XLi, plus video capture so you can get all the best shots. The 8XL brings you 256 glorious colors with unequalled clarity, and is priced within reach. The ClearVue/GSXL gives you 256 shades of gray; perfect for business productivity. And when it comes to low cost, high resolution monochrome, the ClearVue/XL is a clear winner.

With these advancements in the art and science of color, it's no wonder RasterOps aces the competition. For a dynamic 21" system that's a perfect match for you, just see your local RasterOps dealer or call 1.800.SAY.COLOR.



ART BEAT

by Cathy Abes

The tools and the talent behind Macworld's graphics and the techniques that make them possible

Artist: Free-lance illustrator and designer Gordon Studer has done work for a number of publications, including *Time, In Health, Publish,* and the *Los Angeles Times.* Studer also does illustration part-time for the *San Francisco Examiner.* This is his first illustration for *Macworld.*

Tools: Mac IIcx with 8MB of RAM; 80MB internal hard drive; RasterOps 24-bit color board; 13-inch Apple RGB color monitor; Microtek MSF-300ZS color scanner; Adobe Illustrator 3.0; Adobe Photoshop 1.0.7.

How It Was Done: For the illustration that opens this month's "Insights on Adobe Illustrator," Studer started by making a rough sketch in heavy black marker. Using Illustrator, he drew the basic geometric shapes and added colors, then began positioning each shape in relation to the others and experimenting with different colors.

Next he began filling in details for the rest of the drawing, including the glasses, the eyes, and the map. To create the shadow of the glasses, Studer selected and option-dragged them to create a duplicate just below the original. He painted the duplicate with



The final illustration for "Insights on Adobe Illustrator" that appears on page 233.

a slightly darker shade of the skin color. Then, because duplicating an object always brings it to the front, he had to reselect the original white glasses and bring them in front of the shadow.

To create the magnifying effect of the left lens, Studer drew a separate circular object slightly larger than the lens. Because the line he used for the glasses was fairly thick, he didn't need the accuracy of a mask to block out the edges of the shape. He merely pasted the glasses in front of the object.

The dashed line at the top of the illustration is actually two lines. The one in front is a 6-point dashed yellow line with a 20-point dash and 15-point spaces between the dashes; the one underneath it is a 6-point solid black line that shows through the spaces of the dashed yellow line.

The wrinkles on the face were done as blends. Studer created a crescent shape with two points, grouped it, and duplicated it using option-drag. Then he chose the skin color and a slightly darker shade of that color for the blend. Next he ungrouped the original and the duplicate, selected both points of each crescent, selected the blend tool, and clicked on one point of one crescent and the comparable point of the other. After specifying a 15-step blend from dark to light in the dialog box, he selected the blended object, grouped it, and option-dragged it to create a duplicate.

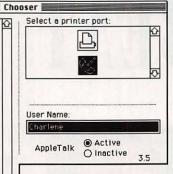
After drawing the black bars and white bars for the background of the map, Studer selected one of the shapes and option-dragged to make a duplicate off to the side. Then, on top of the duplicate, he began drawing the streets and entering the street names. Once the map was finished, he selected the duplicate shape and masked it. After ungrouping the mask and sending it to the back, Studer grouped the mask, the streets, and the street names so he could move them all—as one object—on top of the original shape.

From the start Studer planned to incorporate a photograph into the illustration, eventually settling on a black-and-white print of a pipe. Since he planned to convert the pipe into a color image, Studer scanned it as a 300-dotsper-inch color TIFF file. But even for images he plans to use in gray-scale mode, Studer finds that scanning in color provides better results. He ends up with a scanned image that has more detail than one scanned in black and white.

After importing the file into Photoshop, Studer began colorizing it. First he lassoed the bowl, made it reddish brown, and adjusted the color with the Color Balance slider. Then he gave the stem a darkblue tint. (Because he had to mask the pipe once he brought it into Illustrator, there was no need to position the colors precisely.) Then he selected the whole image and adjusted the brightness and contrast. Next he scanned in a piece (continues)

Explore Our Printer Options!





The Macintosh® software printer drivers seen in this modified Chooser belong to JetLink Express™, PrintLink Collection™ or Mac Daisy Link™. Together these packages support over 600 different laser, dot matrix, inkjet or daisywheel printers.

GDT Softworks Inc.

PO Box 1865 Point Roberts, WA 98281 (604) 291-9121 (800) 663-6222

Circle 317 on reader service card.

DISK DRIVE LOCKTM PROTECT THE INFORMATION YOU DEPEND ON!



- Prevent anyone from copying your data.
- Protect your data from harmful viruses.
- Prevent the unauthorized use of your drive.
- Installs easily and quickly just lock it on.
- Removes easily and quickly

Macintosh models DLK-260 & DLK-261 to fit Mac drives. Model available for 5 1/4" & 3 1/2" drives to fit IBM and compatibles.

Quantity pricing available. Purchase orders accepted. Send for catalog.

Dealer inquiries invited. Shipping not included.

Secure-It, Inc. 18 Maple Ct. East Longmeadow, MA 01028 \$24 95 1-800-451-7592

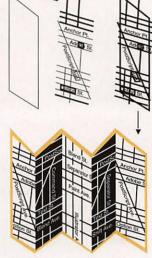
Circle 239 on reader service card.



The basic geometric shapes were drawn and colors added in Illustrator.



Details such as the glasses, the dashed lines, and the panels of the map were added.



After the maps were drawn and a mask made for each map panel, the maps and masks were grouped and placed over the original panels.





The wrinkles were created as 15step blends. The image on top is in Work mode, and the one on the bottom is in Preview mode.

of marble-textured wrapping paper-also scanned as a 300-dpi color TIFF file-and adjusted its color, brightness, and contrast in Photoshop.

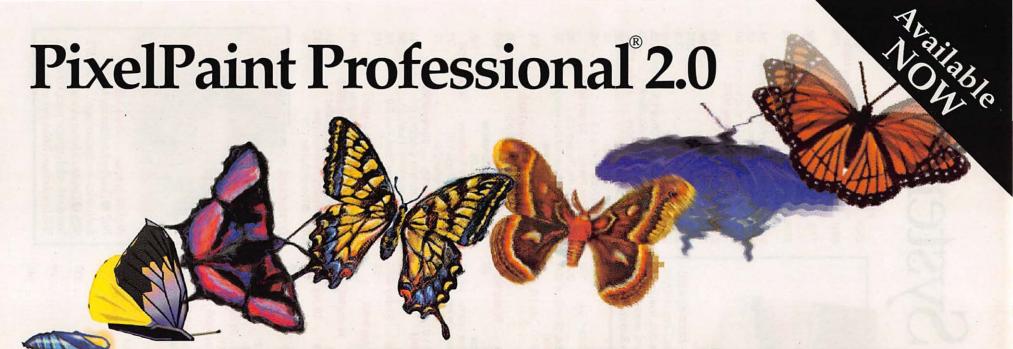
To import the scanned images into Illustrator, he had to save them as EPS files. (When EPS files are imported into another file, they must always accom-



The scanned-in pipe was colorized in Photoshop, then rotated, skewed, and masked in Illustrator.

pany the finished file because they contain vital information that defines the image.) In the EPS Options dialog box, he chose 8 bits/ pixel, Binary coding, Include Halftone Screens, and Include Transfer Functions.

In Illustrator, Studer skewed and rotated the pipe to position it correctly. He used the pen tool to draw a mask around the pipe and did the same for the wrapping paper (the blue background behind the map), drawing its mask in the shape of an arc.



Paint Takes On A New Perspective.

Redefining the Paint Category

PixelPaint Pro *defined* the category of Professional Color Paint. Now, version 2.0 extends the Paint category into artistic image processing. Demanding designwork requiring image compositing, 8-bit masking, transparency and antialiasing or special effects such as embossing, patterning, tinting or controlled warping is dramatically simplified. Photographs can be turned into spectacular art with a few commands or brushstrokes. And precision controls and full color separations mean your designs come out looking the way you expect them to look.

© 1991 SuperMac Technology. PixelPaint Professional is a registered trademark of SuperMac Technology. SuperMac is a trademark of SuperMac Technology. Image created entirely in PixelPaint Professional 2.0 by Claire Barry.

While Better Simulating Traditional Paint

And, if you enjoy working with physical media, Pro 2.0 has the tools you've been searching for! PixelPaperTM, which simulates textured surfaces such as linen, charcoal paper or even concrete, and pressure sensitive brushes, charcoals, pastels and airbrushes, combine to create outstanding, natural, painterly effects on a computer. In autoscrollable documents up to 4000 x 4000 pixels. All with the flexibility of Macintosh®-assisted design—Pro 2.0's object-oriented paint tools allow you to continue manipulating your strokes before applying them to your image.



With Second Generation Interface Breakthroughs

A second generation in Paint, Pro 2.0 is easier to use than ever before because the interface has been redesigned with the designer's needs in mind. Floating palettes and multiple documents allow you to immediately access and apply tools without climbing through a jungle gym of menus. And, with Balloon Help under System 7.0, Pro verbally

tells you what each tool will do. Buy PixelPaint Professional 2.0 now and receive a CookBook tutorial (\$19.95 value) free when you return your registration card. Call 1-800-334-3005 for more information about Pro 2.0.



Circle 118 on reader service card

The new System 7

The original mail order source for Macintosh products. Since 1984. 1991 Macworld World Class Award Nominee for Best Customer Support-Software.

No doubt you've read a lot about System 7. But what will it do for you? Recently, Macworld Contributing Editor Lon Poole—an extremely System 7-savvy kind of guy—visited the production studios of PCTV® and helped us put together a video that makes the power of System 7 perfectly clear. It's free with any order over \$100. Or you can buy one for just \$9 (2244). We also have Lon's book Macworld Guide to System 7 for sale, for \$19 (2238).

Products preceded by the symbol @ are compatible with System 7. For specific features of System 7, please ask your salesperson at the time of your order.

Companies participating in the 30 or 60 day Money Back Guarantee program are highlighted in red. If you are not satisfied with your purchase of any of these products, call us for an authorization and return it with all of the original packaging within the guarantee period for a refund check (or credit on your credit card). We reserve the right to limit quantities on such returns.

We carry only the very latest versions of products. For products or versions not yet released at press time we've indicated the expected availability dates as supplied to us by the manufacturers. Also, all software is not copy-protected, unless indicated otherwise by (CP).

DAILY BUSINESS

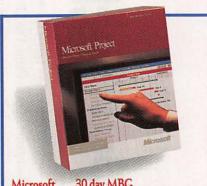
ACCOUNTING, DATABASES, SPREADSHEETS, WORD PROCESSING

*Aatrix Software ... 30 day MBG 5872 OCheckwriter II 3.2 32.



ElseWare Corp. ... 30 day MBG

1506 DataShaper 1.2—The top selling PageMaker companion product, DataShaper is a catalog and directory production lifesaver. Automatically formats your database text files when they are imported into PageMaker \$135.



Microsoft ... 30 day MBG

2565 Microsoft Project 1.1—Effectively schedule tasks & manage resources. Gives unlimited ways to view project information, boardroomquality reports & presentations, resource scheduling across multiple projects & more. . . \$449.

-	
	Abacus Concepts
4482	StatView SE+Graphics 1.03 199.
4481	StatView II 1.03 309.
	SuperANOVA 1.1 (Plus, SE or II) ea. 309.
	Acius 30 day MBG
	04D Write 1.0.1 or 04D Calc 1.0 229.
5618	2 4th Dimension 2.2 485.
6948	
0040	Advanced Software 30 day MBG
5608	DocuComp 1.5
0000	A Lasting Impression
	ResumExpert or Cover Letters ea. 48.
	ResumExpert Software Series ea. 48.
	Ashton-Tate
1324	
7	Avery 60 day MBG
7446	MacLabel Pro 1.0 48.
7	Baseline Publishing 30 day MBG
8881	Thunder 7 1.0.4 56.
7	Chang Labs 30 day MBG
1611	OC.A.T. 3.0 279.
7	Checkfree Corp 30 day MBG
6928	⊘ Checkfree Mac 1.5 19.
7	CheckMark Software 60 day MBG
5862	• Payroll 4.5 175.
5863	MultiLedger 2.0 235.
	Claris
1129	
8216	• FileMaker Pro 1.0V2
1125	MacProject II 2.1V3 359.
7	Deneba Software 30 day MBG
1768	Coach Professional 3.1 124.
	DeltaPoint 60 day MBG
8967	
	Dow Jones 30 day MBG
1942	Market Analyzer Plus 2.0 225.
1500	*ElseWare Corp 30 day MBG **DataShaper 1.2
1506	Fox Software
5572	• FoxBASE + /Mac 2.01 289.
3312	Franklin Software 30 day MBG
7070	Language Master 2.0 45.
1010	Good Software
2527	REM's Property Manager 339.
2021	I II II - IO-finanagor

Individual Software

Informix

Resume Maker 1.3

6222

★Intuit 30 day MBG 2507
2507 Quicken 3.0 (August 91) \$42.
★Kaetron Software 30 day MBG
8941 © TopDown 3.0 219.
★Mainstay 30 day MBG
7718 • MacFlow 3.54 169.
★MECA 60 day MBG
2796 Managing Your Money 4.0 99.
★Microlytics 60 day MBG
9729 OStrunk & White's Elements of Style 34.
7506 • Inside Information 1.0 68.
7820 Random House Encyclopedia 1.0 68.
★Microsoft 30 day MBG
2572 • Schedule Plus 1.0 129.
2884 • Works 2.00D 184.
4969 W ord 4.0D 245.
9803 @Excel 3.0
2565 Project 1.1
5454 The Microsoft Office 1.5 525.
1420 Excel 3.0 Companion Book 20.
★Niles & Associates 30 day MBG
5048 @EndLink 1.1.3 58.
4602 @EndNote 1.3
8010 @EndNote Plus 1.0
★Nolo Press 30 day MBG
4000 Prest in So day MDG
4228 © For the Record 2.0
2981
OCR Systems
9926 ReadRight 1.0
Wodesta 30 day MDG
5621 Double Helix III 3.5 439.
6468 DataDesk 3.0 459.
Paragon Concepts
5683 ONisus 3.06
5683 ② Nisus 3.06
7992 O DynoPage 1.0
6916 ODynodex 2.0
★PowerUp 30 day MBG
7696 • Calendar Creator 1.01 44.
7697 © Letter Writer Plus 1.01 56.
7694 • Address Book Plus 2.0 56.
7694 Address Book Plus 2.0
7000 05-4500
7698
7698 Fast Forms 2.0
7698
7698
7698
7698
7698
7698
7698
7698
7698
7698
7698
7698
7698
7698
7698
7698
7698

Portfolio Systems ... 30 day MBG

7992 DynoPage 1.0-Prints any Mac file-

double-sided—to organizer pages! \$72. 6916 Dynodex 2.0-Fastest address manager.

Print double-sided organizer pages, labels . . 72.

7448 Dynodex Paper-Publish your organizer! 14.

is now on the scene.

+ Pataranas Cathuara 20 day MDC
★Reference Software 30 day MBG 6268 ②Grammatik Mac 2.0
Round Lake Publishing
LetterWorks, Sales or Legal . ea. 52.
★Shana 30 day MBG
8201
8810
7692 • Informed Designer 1.1.1 159.
★Softsync/BLOC 30 day MBG
7129 Accountant, Inc. 2.1.1 339.
★Software Discoveries 30 day MBG
8118 • RecordHolder Plus 3.1 85.
Software Toolworks
8366 • Dollars & Sense 5.0 59.
★Spyglass 60 day MBG
2033 © Format 1.1 (August '91) 159.
2028 Dicer 1.1 (August '91) 399.
2027 Transform 2.0 399 .
★Survivor Software 30 day MBG
3289 MacMoney 3.52 59.



SoftSync/Bloc ... 30 day MBG

7129 Accountant, Inc. 2.1.1-"The most complete integrated accounting and financial management package for the Mac" (MacUser 3/91). Includes Invoicing, Inventory, Receivables, Payables, Payroll & General Ledger \$339.

1000	
,	Symantec 30 day MBG
	@GreatWorks 1.0
3422	More 3.0
1	Synergy 30 day MBG
	• KaleidaGraph 2.1.3 150.
	Teleware 30 day MBG
	6 M.Y.O.B. 2.07 139.
4	TIMESLIPS 30 day MBG
8939	Accounting Link 1.0 52.
2986	Timeslips III 2.0H 194.
	T/Maker 30 day MBG
3639	WriteNow 2.2/Grammatik Mac 119.
7360	WriteNow (3-Pack)
8206	SmartBundle (4 programs in one!) . 215.
1	Williams & Macias 30 day MBG
6926	myDiskLabeler III 3.3 42.
4976	StickyBusiness 1.5 51.
4	WordPerfect 60 day MBG
3800	WordPerfect Mac 2.0.1 279.
7	Wordstar 30 day MBG
6984	Correct Grammar 2.0 55.



Shana ... 30 day MBG

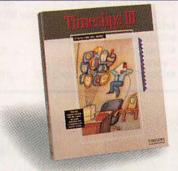
A comprehensive intuitive software solution for forms design, management & data collection. 7692 Informed Designer 1.1.1 \$159.

8810 Informed Manager 1.0.1 99.

GRAPHICS & DESIGN

PUBLISHING, PRESENTATIONS

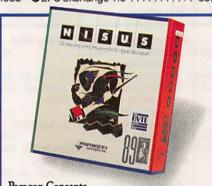
4	Abbott Systems 30 day MBG
8052	
	Adobe Systems
	Adobe Type Library (Vol. 1-230) . cal
6957	Adobe Type Reunion 1.04 41.
8794	Adobe Type On Call 47
5750	Adobe Type Manager 2.0 59
6053	Adobe Plus Pack
6156	Adobe Plus Pack/ATM 174
6098	② TypeAlign for ATM 1.0.4 62
	Adobe TypeSets for Business ea. 95
6671	Adobe Type Set 1 or 6677 Set 2 62.
7587	Adobe Type Set 3 125



TIMESLIPS ... 30 day MBG

2986 Timeslips III 2.0H—Fast, easy, accurate time and billing for service professionals. \$194. 8939 Accounting Link 1.0-Now links with general ledger accounting programs 52.

8042	Adobe Type Sets 1-2-3 Bundle \$239.
8171	Adobe Illustrator 3.0.2 (w/ATM) . 379.
6644	Adobe Photoshop 2.0 (July '91). 549.
5001	• Streamline 2.0
	Smart Art I, II, III, or IV ea. 62.
4	Aldus 30 day MBG
2461	Aldus Gallery Effects 1.0 144.
6674	Aldus Personal Press 1.0.1 211.
3506	Aldus SuperPaint 3.0 (Aug. '91). 144.
3980	Aldus Digital Darkroom 2.0 279.
3507	• Aldus Super 3D (August '91) 349.
7467	• Aldus PrePrint 1.5 349.
4751	Aldus Persuasion 2.0 349.
1330	⊘ Aldus FreeHand 3.0 419.
7088	⊘ Aldus PageMaker 4.01 549.
8054	Aldus Design Team (includes
	PageMaker, FreeHand & PrePrint). 899.
	Altsys
9806	Metamorphosis Pro 2.0 89.
1195	7 Fontographer 3.3 265.
1983	© EPS Exchange 1.0 89.



Paragon Concepts

5683 Nisus 3.06-Boasts ten clipboards, unlimited undos, noncontiguous selection, and a lightning-fast search/replace that can even check unopened files. Plus: graphics and two macro levels for custom features. \$245.

*	Ares Software 30 day MBG
8878	⊘ FontMonger 1.0 62.
	Baseline Publishing 30 day MBG
8055	• Screenshot
7784	OColor MacCheese
7828	© Exposure Pro 78.
	Bitstream
9428	True Type Fonts 1 or 9429 Fonts 2ea.59.
1591	True Type Fonts 3 or 1595 Fonts 4ea.98.
	Broderbund Software
9351	© Kid Pix 1.1 29.
1427	The Print Shop 1.3.2 35.
6281	⊘ TypeStyler 1.5.2
	Casady & Greene 60 day MBG
8879	Fluent Font Library 4.0 99.
1945	True Type Starter Set 57.
	Claris
1123	MacPaint II 2.0 89.
2518	• MacDraw Pro 285.
8007	© Claris CAD 2.0 629.

330C



14 Mill Street, Marlow, NH 03456 603/446-7711 FAX 603/446-7791

How can you learn

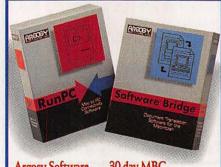


Paracomp 30 day MBG
7441 Swivel 3D Professional 1.0—One of the
best selling 24-bit 3D programs available \$435.
7839 7 FilmMaker 2.0.1—Features full anima-
tion, anti-aliasing and transparency for multi-
media presentations 435.

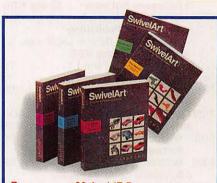
★Creative Software 30 day MBG
6645 © Easy Color Paint 2.0 45.
Custom Applications
8037 © Freedom Press Light 3.01 (17 fonts) 55.
6517 © Freedom of Press 3.01 (35 fonts). 255.
★DeltaPoint 60 day MBG
6095 DeltaGraph 1.5 125.
★Deneba Software 30 day MBG
6365 OUltraPaint 1.03 125.
1769 Canvas 2.1.1 (free upgrade to 3.0) 189.
★Dream Maker 30 day MBG
Cliptures: Sports or Business ea. 68.
Electronic Arts
4315 Studio/8 2.0 189.
8056 Studio/32 1.1
★Foundation Publishing 60 day MBG
6728 • Comic Strip Factory 1.6 36.
9438 Comic Strip/People & Kid Stuff 71.
IDD/Innovative Data Design
2417
4707 • Dreams 1.1 419.
★Letraset 30 day MBG
2619
4709 • LetraStudio 2.0 139.
2621 • Ready Set Go! 4.5A
6301 • ColorStudio 1.5 599.
★Linguist's Software 60 day MBG
Over 100 language fonts call
★Mainstay 30 day MBG
9798
★MediaLab Tech 30 day MBG
9725 PictureAccess (photo scanning) 169
8218 PictureLink 1.1 215.
★MicroFrontier 30 day MBG
7886 @ENHANCE 2.0 235.
★MicroMaps 30 day MBG
7554 • MapArt (Paint)
7556 MapArt (PICT) or 7555 (EPS) ea. 95.
★Microsoft 30 day MBG
2878 PowerPoint 2.01D 245.
★Monotype Typography 30 day MBG
Monotype Imprints-TrueType ea. 22.
Classic Fonts (full line available) call
Multi-Ad Services
8767 Multi-Ad Creator 2.5 455.
PANTONE
7466 Process Color Imaging Guide 48.

1862 Process Color System Guide 48.

-	Damasama 20 day MDC
	Paracomp 30 day MBG
5028	• ModelShop 2.0 \$599.
7728	⊘ SwivelArt 1.0 81.
2460	MapArt I-North & South America. 156.
2459	MapArt II-Europe, Africa, Asia 156.
2458	Viewpoint-Car Collection 156.
2457	Viewpoint-Air & Sea Collection 156.
2463	Viewpoint-Anatomy Collection 156.
7441	O Viewpoint-Ariatority Collection . 156.
7441	Swivel 3D Professional 1.0 435.
	Postcraft International
2210	② Effects Specialist 95.
	Layouts for PageMaker, ReadySetGo,
	& QuarkXPress ea. 69.
	Layouts: Stationery or Flyers ea. 45.
	Quark
7612	
	Q QuarkXPress 3.1 519.
	Springboard 30 day MBG
3530	Certificate Maker 2.02 22.
	Strata
7773	分 Stratavision 3D 2.0 549.
*	SuperMac Tech 60 day MBG
3380	PixelPaint 2.1 149.
5625	PixelPaint Pro 2.0 499.
3023	Tracks Coffeen 200 days 100
200	Tactic Software 30 day MBG
8251	Icon It! 2.1
8252	Magic Typist or 8249 Art Fonts . ea. 49.
8263	Art Clips 1 . 49. 8261 Art Clips 2 . 64.
8248	FontShare 2.2
	3G Graphics
3942	Timages with Impact: Graphics 1 . 49.
4583	Images with Impact: Business 1 . 64.
	Olimages with Impact. Busiless 1 . 64.
2003	Images with Impact: People 1 94.
6379	Accents & Borders I 64.
	Timeworks 30 day MBG
7115	Publish It! Easy 2.11 139.
*	T/Maker 30 day MBG
	Full line available.
	ClickArt (hitmanned) ea 32
	ClickArt (bitmapped) ea. 32. ClickArt (EPS format) ea. 82.
1000	Color Graphics Presentation 109.
1292	Color Graphics Presentation 109.
Taxable 1	Ventura Software
8962	Ventura Publisher 3.0 499.
*	Visual Business Sys 30 day MBG
9867	@ GraphMaster 1.1 189.
*	Wildflower 30 day MBG
6512	7 SnapJot 3.01
JU 12	Zedcor 60 day MBG
2000	DeskPaint & DeskDraw 3.0.3 113.
3980	UDESKFAITI & DESKDIAW 3.0.3 113.
_	
To the same	ON RICORY



Argosy Software ... 30 day MBG
7872 Software Bridge/Mac 2.0.1—Translate documents between over 30 Mac and PC word processors. Mount DOS disks.... \$99. 2448 Run PC/Network—Connect to a PC and run DOS programs. Incl. Software Bridge . 279.



Paracomp ... 30 day MBG

SwivelAn Collections—Detailed 3D models to use in graphics and presentation applications.

Customized by illustrators and multimedia

specialists (Map #1-Americas, Map #2-Europe, Anatomy, Air & Sea, and Cars). ea. \$156.

PROGRAMMING

UTILITIES, HYPERCARD, SECURITY

*	Abbott Systems 30 day MBG
2515	• Calc+ 1.0
5236	
*	Advanced Software 30 day MBG
8051	⊘ Intouch 1.1
9986	Intouch Networking (3-Pack) 112.
*	Affinity Microsystems 60 day MBG
7835	Tempo II Plus 2.0.3 105.
	After Hours Software
1352	TouchBASE 2.0
	TouchBASE Paper
*	Aladdin Systems 30 day MBG
6169	©Shortcut 1.5 45.
6740	② Stufflt Deluxe 2.0
*	Aldus 30 day MBG
5100	Aldus SuperCard 1.6 211.
*	ALSoft 30 day MBG
9807	DiskExpress II 2.07 53.
9808	
9886	
	Apple Computer/Claris
1074	System 7(with free PCTV video) 99.
8734	HyperCard Development Kit 2.1 149.
*	Argosy Software 30 day MBG
7872	
2448	₱RunPC/Network 279.
*	ASD Software 30 day MBG
9440	MaccessCard Reader 299.
9439	Triangular in Guara (1) Dariais See.
7085	⊘ FileGuard 2.7 (1 user) 139.
7422	② (5 user). 489. 7423 (10 user). 799.
	Baseline Publishing 30 day MBG
7783	⊘ INIT Manager
*	Berkeley Systems 30 day MBG ② After Dark 2.0T 28. ② More After Dark (M.A.D) 23.
5737	• After Dark 2.0T 28.
2198	• More After Dark (M.A.D) 23.
2196	After Dark & M.A.D. Bundle 42.
1541	OStepping Out II 2.02 54.
0044	Bright Star Technology

2614 At Your Service

★ Casady & Greene ... 60 day MBG 2269 **②**QuickDEX 2.0 34. 2528 (5 Pak) 99.

7443 A.M.E. (1 user). 159. 7831 (10 user).849.

what this will mean?

Dubl-Click Software



Palomar Software ... 30 day MBG

8210 • PLOTTERgeist 2.0—System 7-savvy
Chooser-level driver connects plotters to your
Mac. First to provide presentation-quality
True Type and ATM text; also features background plotting and easy-to-use interface \$249.

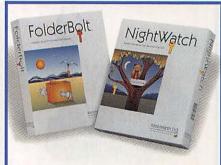
*	CE Software 60 day MBG
1727	©CalendarMaker 3.0.1 31.
6278	⊘ DiskTop 4.01 63.
7518	② Alarming Events 1.03 84.
8024	
*	Central Point 30 day MBG
5041	Mac Tools Deluxe 1.2 79.
*	Connectix 30 day MBG
7830	Maxima 2.0 45.
	OVirtual 3.0 (August '91) 74.
6647	⊘ HandOff II 2.2
	Mode 32 1.0 95.
*	Dantz Development 30 day MBG
5255	
7945	Retrospect Remote 1.3 264.
7946	Remote (10 Pack of inits) 147.
1	Digitalk 60 day MBG
5166	⊘ SmallTalk/V Mac 1.1 123.



ON Technology ... 1 year MBG

9801 • Meeting Maker (5 user)—Plan, schedule & confirm meetings via network. Schedule a time & date, select required guests, & prepare agendas. Personal calendar to block out activities . \$309. 9800 • Meeting Maker (10 user) 549.

	Dubi-Click Software
7974	⊘ ClickChange 1.05 \$56.
1824	Calculator Construction Set 2.09.6 62.
*	ElseWare Corp 30 day MBG
1507	Bar Code Kit
1007	Bar Code Kit
×	Firth Generation 30 day MBG
4287	• PYRO! 4.01
3955	Suitcase II 1.2.10 49.
8286	SuperLaserSpool 2.02 93.
5178	@FastBack II 2.5
5725	© DiskLock 2.01
0120	FWB, Inc 30 day MBG
	Hard Disk Partition 57.
2319	Hard Disk DeadBolt 57.
*	Go Technology 60 day MBG
1488	O Hot Keys Universal (word process.) 36.
*	Insight Development 30 day MBG
6171	MacPrint 1 23 93
0171	MacPrint 1.23
0000	Somet Alemany Annt Dian 2 07 CO
6089	Smart Alarms w/Appt. Diary 3.07 63.
*	Kensington 30 day MBG
9301	PassProof (right) or 9300 (left) ea. 65.
*	Kent Marsh Ltd 30 day MBG
5457	Ouicklock 2.0 34
9513	© FolderBolt 1.01 73.
2501	• FolderBolt 1.01
2091	The Nightwater 1.03 64.
6134	• MacSare II 2.0 10b.
*	Kiwi Software 60 day MBG
6267	⑦ KiwiEnvelopes! 3.1.1
*	Loop Software 30 day MBG PictureBook 3.2A
5442	PictureBook 3.2A
+	Magic Software 30 day MBG
*	Magic Software 30 day MBG
7267	Magic Software 30 day MBG AutoSave II 2.0
7267	Magic Software 30 day MBG AutoSave II 2.0
7267 7270	Magic Software 30 day MBG ◆ AutoSave II 2.0 26. ◆ Backmatic 2.0 50. Microcom 30 day MBG
7267 7270 ** 8562	Magic Software 30 day MBG ② AutoSave II 2.0 26. ② Backmatic 2.0 50. Microcom 30 day MBG ② Complete Undelete 1.1 48.
7267 7270 ** 8562 4803	Magic Software 30 day MBG Ø AutoSave II 2.0 26. Ø Backmatic 2.0 50. Microcom 30 day MBG Ø Complete Undelete 1.1 48. Ø Virex 3.2 57.
7267 7270 ** 8562 4803 8561	Magic Software 30 day MBG ② AutoSave II 2.0 26. ② Backmatic 2.0 50. Microcom 30 day MBG ② Complete Undelete 1.1 48. ② Virex 3.2 57. ③ 211 Hillings 89.
7267 7270 ** 8562 4803 8561	Magic Software 30 day MBG ② AutoSave II 2.0 26. ② Backmatic 2.0 50. Microcom 30 day MBG ② Complete Undelete 1.1 48. ② Virex 3.2 57. ③ 211 Hillings 89.
7267 7270 ** 8562 4803 8561 2462	Magic Software 30 day MBG ② AutoSave II 2.0 26. ② Backmatic 2.0 50. Microcom 30 day MBG ② Complete Undelete 1.1 48. ② Virex 3.2 57. ③ 911 Utilities 89. ② Citadel with Shredder 89.
7267 7270 ** 8562 4803 8561 2462	Magic Software 30 day MBG ② AutoSave II 2.0 26. ② Backmatic 2.0 50. Microcom 30 day MBG ② Complete Undelete 1.1 48. ② Virex 3.2 57. ③ 911 Utilities 89. ② Citadel with Shredder 89.
7267 7270 ** 8562 4803 8561 2462 **	Magic Software 30 day MBG ② AutoSave II 2.0 26. ② Backmatic 2.0 50. Microcom 30 day MBG ② Complete Undelete 1.1 48. ② Virex 3.2 57. ③ 911 Utilities 89. Microseeds Pub. 60 day MBG ② INITPicker 2.02 34
7267 7270 8562 4803 8561 2462 7068 2913	Magic Software 30 day MBG ② AutoSave II 2.0 26. ② Backmatic 2.0 50. Microcom 30 day MBG ② Complete Undelete 1.1 48. ④ Virex 3.2 57. ⑤ 11 Utilities 89. ④ Citadel with Shredder 89. Microseeds Pub 60 day MBG ⑥ INITPicker 2.02 34. ④ Redux 1.63 49. 7116 ④ Rival 1.1.6 49.
7267 7270 8562 4803 8561 2462 7068 2913	Magic Software 30 day MBG ② AutoSave II 2.0 26. ② Backmatic 2.0 50. Microcom 30 day MBG ② Complete Undelete 1.1 48. ④ Virex 3.2 57. ⑤ 11 Utilities 89. Microseeds Pub 60 day MBG ⑥ INITPicker 2.02 34. ② Redux 1.63 49. 7116 ② Rival 1.1.6 49. Microsoft 30 day MBG
7267 7270 8562 4803 8561 2462 7068 2913	Magic Software 30 day MBG AutoSave II 2.0 26. Backmatic 2.0 50. Microcom 30 day MBG O Complete Undelete 1.1 48. Ø Virex 3.2 57. Ø 911 Utilities 89. Ø Citadel with Shredder 89. Microseeds Pub 60 day MBG Ø INITPicker 2.02 34. Ø Redux 1.63 49. 7116 Ø Rival 1.1.6 49. Microsoft 30 day MBG QuickBasic 1.0 64.
7267 7270 \$562 4803 8561 2462 7068 2913	Magic Software 30 day MBG ② AutoSave II 2.0 26. ③ Backmatic 2.0 50. Microcom 30 day MBG ④ Complete Undelete 1.1 48. ④ Virex 3.2 57. ④ 911 Utilities 89. ④ Citadel with Shredder 89. Microseeds Pub. 60 day MBG ④ INITPicker 2.02 34. ④ Redux 1.63 49. 7116 ④ Rival 1.1.6 49. Microsoft 30 day MBG QuickBasic 1.0 64. Multi-Ad Services
7267 7270 \$562 4803 8561 2462 7068 2913 4471 8850	Magic Software 30 day MBG ② AutoSave II 2.0 26. ③ Backmatic 2.0 50. Microcom 30 day MBG ② Complete Undelete 1.1 48. ④ Virex 3.2 57. ④ 911 Utilities 89. ④ Citadel with Shredder 89. Microseeds Pub. 60 day MBG ④ INITPicker 2.02 34. ④ Redux 1.63 49. 7116 ④ Rival 1.1.6 49. Microsoft 30 day MBG QuickBasic 1.0 64. Multi-Ad Services 64. Multi-Ad Search 1.0 115.
7267 7270 \$562 4803 8561 2462 7068 2913 4471 8850	Magic Software 30 day MBG ② AutoSave II 2.0 26. ③ Backmatic 2.0 50. Microcom 30 day MBG ② Complete Undelete 1.1 48. ④ Virex 3.2 57. ④ 911 Utilities 89. ④ Citadel with Shredder 89. Microseeds Pub. 60 day MBG ④ INITPicker 2.02 34. ④ Redux 1.63 49. 7116 ④ Rival 1.1.6 49. Microsoft 30 day MBG QuickBasic 1.0 64. Multi-Ad Services 64. Multi-Ad Search 1.0 115.
7267 7270 8562 4803 8561 2462 7068 2913 4471 8850	Magic Software 30 day MBG Ø AutoSave II 2.0 26. Ø Backmatic 2.0 50. Microcom 30 day MBG © Complete Undelete 1.1 48. Ø Virex 3.2 57. Ø 911 Utilities 89. Ø Citadel with Shredder 89. Microseeds Pub. 60 day MBG Ø INITPicker 2.02 34. Ø Redux 1.63 49. 7116 Ø Rival 1.1.6 49. Microsoft 30 day MBG QuickBasic 1.0 64. Multi-Ad Services Ø Multi-Ad Search 1.0 115. Nine to Five Software 30 day MBG
7267 7270 8562 4803 8561 2462 7068 2913 4471 8850	Magic Software 30 day MBG Ø AutoSave II 2.0 26. Ø Backmatic 2.0 50. Microcom 30 day MBG © Complete Undelete 1.1 48. Ø Virex 3.2 57. Ø 911 Utilities 89. Ø Citadel with Shredder 89. Microseeds Pub. 60 day MBG Ø INITPicker 2.02 34. Ø Redux 1.63 49. 7116 Ø Rival 1.1.6 49. Microsoft 30 day MBG QuickBasic 1.0 64. Multi-Ad Services Ø Multi-Ad Search 1.0 115. Nine to Five Software 30 day MBG
7267 7270 8562 4803 8561 2462 7068 2913 4471 8850 9767	Magic Software 30 day MBG ② AutoSave II 2.0 50. ② Backmatic 2.0 50. Microcom 30 day MBG ② Complete Undelete 1.1 48. ④ Virex 3.2 57. ⑤ 911 Utilities 89. Ø Citadel with Shredder 89. Microseeds Pub. 60 day MBG ⑤ INITPicker 2.02 34. ④ Redux 1.63 49. 7116 ⑥ Rival 1.1.6 49. Microsoft 30 day MBG QuickBasic 1.0 64. Multi-Ad Services Multi-Ad Search 1.0 115. Nine to Five Software 30 day MBG ④ Reports 2.0 94. Now Software 30 day MBG
7267 7270 8562 4803 8561 2462 7068 2913 4471 8850 9767 6925	Magic Software 30 day MBG ② AutoSave II 2.0 26. ② Backmatic 2.0 50. Microcom 30 day MBG ② Complete Undelete 1.1 48. ④ Virex 3.2 57. ④ 911 Utilities 89. ④ Citadel with Shredder 89. Microseeds Pub. 60 day MBG ④ INITPicker 2.02 34. ④ Redux 1.63 49. 7116 ④ Rival 1.1.6 49. Microsoft 30 day MBG QuickBasic 1.0 64. Multi-Ad Services ⊕ Multi-Ad Services ④ Multi-Ad Services ⊕ Multi-Ad Services ④ Multi- Ad Services ⊕ Multi- Russian Services ④ Multi- Russian Services ⊕ Multi- Russian Services ④ Multi- Russian Services ⊕ Multi- Russian Services ④ Now Software 30 day MBG ④ Now Utilities 3.0 (September '91) 84.
7267 7270 8562 4803 8561 2462 7068 2913 4471 8850 9767 6925	Magic Software 30 day MBG ② AutoSave II 2.0 26. ② Backmatic 2.0 50. Microcom 30 day MBG ② Complete Undelete 1.1 48. ④ Virex 3.2 57. ⑤ 911 Utilities 89. ④ Citadel with Shredder 89. Microseeds Pub. 60 day MBG ④ INITPicker 2.02 34. ④ Redux 1.63 49. 7116 ④ Rival 1.1.6 49. Microsoft 30 day MBG QuickBasic 1.0 64. Multi-Ad Services ⊕ Multi-Ad Search 1.0 115. Nine to Five Software 30 day MBG ④ Reports 2.0 94. Now Software 30 day MBG ④ Now Utilities 3.0 (September '91). 84. ON Technology 1 year MBG
7267 7270 8562 4803 8561 2462 7068 2913 4471 8850 9767 6925 6385	Magic Software 30 day MBG ② AutoSave II 2.0 50. ③ Backmatic 2.0 50. Microcom 30 day MBG ② Complete Undelete 1.1 48. ② Virex 3.2 57. ③ 911 Utilities 89. ④ Citadel with Shredder 89. Microseeds Pub 60 day MBG ④ INITPicker 2.02 34. ④ Redux 1.63 49. 7116 ④ Rival 1.1.6 49. Microsoft 30 day MBG QuickBasic 1.0 64. Multi-Ad Search 1.0 115. Nine to Five Software 30 day MBG ④ Now Software 30 day MBG ④ Now Utilities 3.0 (September '91) 84. ④ Now Utilities 3.0 (September '91) 84. ④ On Location 1.02 75.
7267 7270 8562 4803 8561 2462 7068 2913 4471 8850 9767 6925 6385 9801	Magic Software 30 day MBG ② AutoSave II 2.0 26. ③ Backmatic 2.0 50. Microcom 30 day MBG ② Complete Undelete 1.1 48. ② Virex 3.2 57. ③ 911 Utilities 89. ④ Citadel with Shredder 89. Microseeds Pub 60 day MBG ④ InTPicker 2.02 34. ④ Redux 1.63 49. 7116 ④ Rival 1.1.6 49. Microsoft 30 day MBG QuickBasic 1.0 64. Multi-Ad Search 1.0 115. Nine to Five Software 30 day MBG ④ Now Utilities 3.0 (September '91) 84. ④ Now Utilities 3.0 (September '91) 84. ⑥ On Location 1.02 75. ④ Meeting Maker (5) 309. 9800 (10) 549.
7267 7270 8562 4803 8561 2462 7068 2913 4471 8850 9767 6925 6385 9801 2570	Magic Software 30 day MBG ②AutoSave II 2.0
7267 7270 8562 4803 8561 2462 7068 2913 4471 8850 9767 6925 6385 9801 2570	Magic Software 30 day MBG ②AutoSave II 2.0
7267 7270 8562 4803 8561 2462 7068 2913 4471 8850 9767 6925 6385 9801 2570	Magic Software 30 day MBG ②AutoSave II 2.0
7267 7270 8562 4803 8561 2462 7068 2913 4471 8850 9767 6925 6385 9801 2570	Magic Software 30 day MBG ② AutoSave II 2.0 26. ③ Backmatic 2.0 50. Microcom 30 day MBG ② Complete Undelete 1.1 48. ④ Virex 3.2 57. ④ 911 Utilities 89. ④ Citadel with Shredder 89. Microseeds Pub. 60 day MBG ④ INITPicker 2.02 34. ④ Redux 1.63 49. 7116 ④ Rival 1.1.6 49. Microsoft 30 day MBG QuickBasic 1.0 64. Multi-Ad Search 1.0 115. Nine to Five Software 30 day MBG ④ Now Utilities 3.0 (September '91) 84. ON Technology 1 year MBG ④ On Location 1.02 75. ④ Meeting Maker (5) 309. 9800 (10) 549. ④ Instant Update (2) 309. 2571 (5) 619. Palomar Software 30 day MBG ④ PLOTTERgeist 2.0 249.
7267 7270 8562 4803 8561 2462 7068 2913 4471 8850 9767 6925 6385 9801 2570	Magic Software 30 day MBG ②AutoSave II 2.0



Kent Marsh Ltd. ... 30 day MBG

A winning team! The perfect combination of hard disk and folder security. Rigorous yet elegantly simple. Full or read-only protection with a click of the mouse. And much more! 9513 © FolderBolt \$73. 2591 © Night Watch \$84.

★Symantec ... 30 day MBG 5176 ②Symantec AntiVirus for Mac (SAM) 66. 5724 ③Symantec Utilities for Mac (SUM II) 99. 6748 ④Norton Utilities for the Mac 1.1... 87.

8273 Mathematica Enhanced 2.0 (Aug.) 799.



ON Technology ... 1 year MBG

2570 Instant Update 1.0 (2 user)—Create live documents that groups produce and work on together. Changes to the document from network users are saved with a click of a button. \$309. 2571 Instant Update 1.0 (5 user). 619.

330C

MMC

MacConnection

14 Mill Street, Marlow, NH 03456 603/446-7791 FAX 603/446-7791

★Softstream ... 30 day MBG

3377 ODiskFit 2.0....

5440 O HyperHit 3.0 119. 1568 (network) 389.

3448 SmartScrap & The Clipper 2.1... 56.

★SuperMac Tech. ... 60 day MBG

★Solutions, Inc. ... 60 day MBG

To help you find out



Global Village ... 30 day MBG TelePort A300-1990 MacUser Editors' Choice Award for Best Communications Product. 2400 bps/MNP-5 modem connects via ADB Port. SendFax (9600 baud) optional. 8946 Basic . \$139. 8945 with FAX . \$185.

CD-ROM

Adoha Systams

	Adobe Systems
8794	Adobe Type On Call CD/ATM 47.
9443	Adobe TOC & Porta Drive Bundle . 659.
	CD Technology
2321	CD-ROM Caddy 11. 2533 (5) 49.
8057	Porta Drive CD-ROM 649.
7686	Porta Drive & MS Office CD-ROM . 999.
	Discovery Systems 60 day MBG
9968	Birds of North America (CD-ROM) 26.
9965	Sherlock Holmes on Disc (CD-ROM) 26.
9966	Shakespeare on Disc (CD-ROM) 26.
9967	
1874	Mammals of N. America (CD-ROM) 52.
2484	
	Dubl-Click
9944	The WetSet CD (CD-ROM) 218.
,	Everex 30 day MBG
1875	Metro CD CD-ROM Drive 649.
,	Highlighted Data 30 day MBG
7771	
,	HyperGlot 30 day MBG
9778	Learn to Speak English, 7473 French,
	or 7829 Spanish (CD-ROM) ea. 64.
2615	
7	Microsoft 30 day MBG
	The Microsoft Office (CD-ROM) 599.
7	Monotype Typography 30 day MBG
	Classic Font Library on CD-ROM call
	NEC
6637	Clip-Art 3D (2500 full-color images) 246.
6636	Image Gallery (2800 line art) 246.
6959	, p ,
9441	
2478	General Reference CD-ROM Bundle
	(inludes CDR36 kit & 3 titles) 529.
	Penton Overseas 30 day MBG
2611	Vocabulearn/ce Spanish 1 CD 59.
2610	Vocabulearn/ce French 1 CD 59.
7	rSomak 30 day MBG
	LaserArt I or II (CD-ROM) ea. 62.
	Tactic Software 30 day MBG
2519	Tarana triodia ob
0746	Toshiba
6/49	XM 3201 CD-ROM Drive 659.

VIDEO & SOUND MUSIC, MIDI, ANIMATION

*	Ars Nova 30 day MBG
1215	Practica Musica 2.2 \$66.
	Articulate Systems
2034	Voice Impact 82.
2232	Voice Impact Pro 179.
9975	Voice Navigator II 549.
	Bogas Productions 60 day MBG
9279	Studio Session MIDI Utility 1.0 59.
6135	Super Studio Session w/Music Library 99.
	Coda Music Systems
8188	
5604	⊘ Finale 2.6.1
	Computer Friends
8271	② ColorSnap 32 + 1.1 649.
	Electronic Arts
1846	Deluxe Music Construction Set 2.5. 84.
*	Farallon Computing 30 day MBG
6770	MacRecorder Voice Digitizer 2.0.3 104.
2199	MacRecorder Sound System 2.0.3 174.
6766	MediaTracks 1.0 205.



Apple Computer/Claris 1074 System 7-Balloon help, File sharing, Publish & Subscribe, Aliasing, True Type, Virtual memory, 32-bit addressing. Buy now & get a free PCTV® video (limit 1 per customer) with Lon Poole explaining all these new features \$99.

	Full Logic Studios
1163	CALFORDALIST CONTROL AND CALFORD AND CONTROL AND CONTR
	MacroMind 30 day MBG
9353	MediaMaker 1.0 489.
6159	MacroMind Accelerator 2.01 125.
5087	
2246	
	Mass Microsystems
2592	
	Paracomp 30 day MBG
7839	
	Passport Designs
8253	TRAX 2.0.1 57.
3117	Master Tracks PRO 4 4.5 (Aug.) 315.
8250	©Encore 2.0
3115	MIDI Interface
	PCTV
2244	System 7 Video (VHS)9.
2245	System 7 Video with Lon's Book 25.
	Pixar
1596	MacRenderMan/ShowPlace Bundle 649.
30-110-0	RasterOps
	Full line available. Partial listing.
8526	Video Expander 499.
	,

9784	RasterOps 24SI
	RasterOps 24STV 1249.
	Symmetry 30 day MBG
	Mariah 1.0 93.
	Total Systems 30 day MBG
	Galileo I Video (Plus) 449.
8653	Galileo I Video (SE) 449.
	Voyager 30 day MBG
	Voyager Videostack 2.0 69.
	Voyager CD Audiostack 69.
9326	
9327	Igor Stravinsky (CD-ROM) 69.
	LEARN & PLAY
FORE	IGN LANGUAGES, TRAINING, GAMES

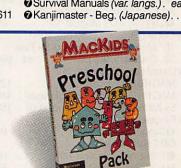
★Abracadata, Ltd 30 day MBG
9995
9990 Design Your Home - Architecture,
9992 Interiors or 9994 Landscape ea.63
Libraries available cal
Accolade
1423 Hard Ball II
8220 Jack Nicklaus Golf
★Aldus 30 day MBG
3503 Dark Castle or 3502 Beyond DC ea. 36
★Baseline Publishing 30 day MBG
7785 • Talking Moose
★Beacon Technology 30 day MBG
HyperBible 2.03 (KJ or NI) . ea. 125
Broderbund Software
4314 © Type! 1.0
6516 The Playroom 1.1 (CP)
Carmen Sandiego Series (CP)ea. 29
6384 PlayMaker Football 1.1.1 29
9804 RoboSport or 8195 @BannerMania 35.
8266 SimEarth 1.0
4966 SimCity 1.2 (<i>CP</i>)
5871 SimCity Supreme 1.2C
★Carina Software 30 day MBG
5726 Voyager 1 2
5726 Voyager 1.2
★Casady & Greene 60 day MBG 2268
Starlight or 7498 ② Sky Shadow ea. 29. ★Centron Software 30 day MBG
8525 Casino Master 3.24 (B&W) 41.



Que Corp. ... 30 day MBG 7482 Right Writer for the Mac 3.1—Instantly improve your writing. Right Writer for the Mac makes it simple. With a few clicks of the mouse, Right Writer checks your grammar, style, word usage and punctuation \$54.

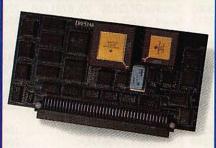
what it's all about

	Davidson & Associates
6128	Math Blaster Mystery 1.0 (CP) \$29.
8050	• EARTHQUEST 2.0 48.
	Electronic Arts
6716	Pipe Dreams 1.2 17.
8643	Harpoon
1907	• PGA Golf (August '91) 39.
	FTL/Software Heaven
1555	② OIDS
*	Great Wave 30 day MBG
2276	
4334	
8044	
1517	• ReadingMaze. 26. 1513 (Color). 36.
*	HyperGlot Software 30 day MBG
	Word Torture 4.0-Beginner to Advanced
	(Span., Fren., Germ., Ital. & Rus.) ea. 35.
	Pronunciation Tutor - Beginner
	(Span., Fren.) ea. 35. (Germ., Chin.) 39.
	Verb Tutor - Intermediate
	(Spanish, French, German) ea. 39.
	Survival Manuals (var. langs.). ea. 39.
6611	



Nordic Software ... 30 day MBG 8257 Preschool Pack - Color 1.0—Teaches children their A, B, C's and 1, 2, 3's in a light and enthusiastic manner using color animation, graphics and sound. Six different modules

7	Inline Design 30 day MBG	
1562	3 in Three 1.1 (August '91)	31.
8809	Tesserae or 7622 Darwin's Dilemma	31
1944	② Swamp Gas	31
	Interplay Productions	
1894	BattleChess (3D animation)	29
1893	CheckMate (infinite play levels)	31
1	Learning Company 30 day Mi	
	Reader Rabbit 3.0 (CP) (ages 4-7)	
	Leister Productions 30 day M	
	• Reunion 2.0	
	Microprose	
2008		40.
	Microsoft 30 day MBG	
	Flight Simulator 1.02 (CP)	33.
	Nordic Software 30 day MBG	
8260	Word Quest 1.0	30.
00E7	PreSchool Pack - Color 1.0	35



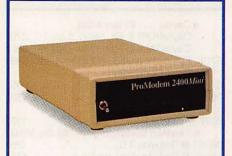
DayStar Digital ... 30 day MBG PowerCache 030-Now the even faster Power-Cache will fit almost any Mac. Available in 25, 40 & 50 MHz, it can triple your performance. Proven 030 compatibility works with everything! see line listing.

★Penton Overseas ... 30 day MBG VocabuLearn/ce Levels | & II (French, Italian, Spanish, German, Russian, Hebrew, & Japanese). ea. 35. ★Personal Training Sys. ... 60 day MBG Training for System 7, QuarkXPress, Persuasion, FileMaker II/Pro, PageMaker, Illustrator, FreeHand, Word, HyperCard, Excel, & the Mac (beg. to adv.). ea. 50. Sierra On-line 9733 Hoyle's Book of Games II . . 7367 Space Quest III (color regs. 2 MB) . . 35. Sir-Tech Software 8229 Bane of the Cosmic Forge..... 35. 8228 Wizardry II: Knight of Diamonds (CP) 28. **Software Toolworks** 4619 Mavis Beacon Typing 1.3 (CP)... 32. World Atlas or 1910 U.S. Atlas ea. 52. 1908



Freesoft ... 60 day MBG 6115 White Knight 11-10 award winning communications program that supports XMODEM, YMODEM, ZMODEM, Kermit, and Compu-Serve Error Correcting protocols. Includes Okyto 1.0 and a free subscription to GEnie \$85.

3464	Spectrum Holobyte 30 day Mi Tetris 1.3 or 6112 Welltris 1.1 ea. \$	25
8180	Faces 1.0	25
	Falcon 2.2.1 or 8181 @ Vette 1.0 ea.	33
	Spinnaker 30 day MBG	
2328	Sargon IV 1.03 (CP) (chess)	28
1	Strategic Studies 30 day MBG	
8085	Panzer Battles	26
8084	Halls of Montezuma	26
	StudyWare	
	ACT, GMAT, GRE, or SAT Prep . ea.	29
8098	LSAT Prep for the Mac 2.5	35
7	Terrace Software 30 day MBG	
8192	Mum's The Word 1.0 (gardening)	79
*	Toyogo 30 day MBG	
1993	Nemesis Scribbler	31.
	Nemesis Go Master 5.0 (August '91)	
2471	Nemesis Deluxe Toolkit	72
	XOR 30 day MBG	
	MacGolf Classic 1.0 (CP)	52



Prometheus ... 30 day MBG 2590 ProModem 2400 Mini Plus-V.42bis/MNP5 data compression and error correction added to a 2400 bps mini modem at no additional cost. Includes MAcKNOWLEDGE communications software, and cable \$124.

COMMUNICATIONS

MODEMS, MAIL, NETWORKS

7	Abaton 30 day MBG
6266	InterFax 24/96 Modem 299.
	Applied Engineering
8363	DataLink/Mac Portable 209.
	Q QuadraLink 1.1.1 205.
	Beagle Bros 30 day MBG
	© Flash 1.2 125.
	CE Software 60 day MBG
	QuickMail 2.5 (5) 249. 5173 (10) 375.
	CompuServe 60 day MBG
	Macintosh Membership Kit 1.03 . 22.
16/3	CompuServe Navigator 3.04 49.
1674	Membership Kit/Navigator Bundle 68.
*	DataViz 60 day MBG
1823	MacLink Plus/PC 5.0 129.
4842	MacLink Plus/Translators 5.0 109.

330C

MMC

We have a new video



Dayna ... 60 day MBG

Dayna's line of DaynaPORT EtherNet adaptors allow users to connect all models of Macintosh computers to any type of EtherNet cabling, including 10 Base T.....\$279.

The second	0
4	Dayna 60 day MBG
	DaynaPORT E: SE, SE/30, II, IIsi, LC 279.
0710	
8719	EtherPrint or 9888 (10 Base T) ea. 349.
	Dove Computer
6758	DoveFax Desktop 1.1.1 295.
9634	DoveFax+ 1.1.1
	EveryWare
8077	AllShare 1.1.4
*	Farallon Computing 30 day MBG
9805	Timbuktu 4.0
4866	⊘ Timbuktu/Remote 2.0.1 135.
8707	Liaison 3.0.2
9960	PhoneNET Talk
9961	PhoneNET Card PC 209.
6273	PhoneNET StarConnector 10-Pack. 129.
4869	PhoneNET Connector 10-Pk (DIN8) 198.
2206	PhoneNET StarController 300 899.
6687	PhoneNET StarController-EN 500 1739.
0.0000000000000000000000000000000000000	Freesoft 60 day MBG
6115	White Knight 11 85.
	Global Village 30 day MBG
8946	⊘ TelePort A300 139.
8945	TelePort/FAX 185.
0343	Haves
2300	
	©Smartcom II 3.2A 84.
8614	Personal Modem 2400 Plus 149.
7391	Ultra 9600 Modem 669.
	Insight Development 30 day MBG
1296	Mosaic 1.0 (3). 249. 1295 (10). 375.
and the same	Insignia Solutions
7557	• Access PC 1.1 62.
7058	SoftPC-AT/EGA Module 1.4 124.
9726	SoftPC 2.0 (Classic, LC, SE, Port.) 135.
4089	© SoftPC 1.3 245.
	Intel Corporation
	0.400=1414

6420 2400EX MNP Modem. 229. ★Int'l Business Software ... 30 day MBG

5632 Drive 2.4 (31/2") (incl. FastBack II) . 325.

7459 CarbonCopy Mac (single) 59.

1556 CarbonCopy Mac (unlimited) . . 179.

8027 MacModem V.32 689.

8581 DataClub (3) 199. 8580 (10) **Kennect Tech.** ... 30 day MBG

★Microcom ... 30 day MBG

	rNuvotech 60 day MBG TurboNet Connector (DIN8 or DB9)	\$19.
3000	TurboNet ST (DIN8) 30, 6751 (12)	279.
	NuvoLink SC	
UZIZ	Orange Micro 30 day MBG	000.
	Orange386 (16 MHz)	1670
	Practical Peripherals 30 day i	
3102		179.
and the state of t		
	2400 V.42 bis Modem	209.
7934	PM9600SA Modem 1.26	489.
	SmartPack 9600	529.
	Prometheus 30 day MBG	
2590	ProModem 2400 Mini Plus	124.
8349	ProModem 24/96 MSR	
8738		599.
8990	ProModem Ultima	689.
1	Shiva 30 day MBG	
3444		275.
4347	NetBridge or 4942	409.
3443		339.
8189	FastPath V	
	Sitka/TOPS	NO.
4188	Teleconnector (DIN8) 23. 2230 (10)	189
3720	TOPS Flashcard	
6264	TOPS Network 3.1 (August '91) .	107



Haves

8614 Personal Modem 2400 Plus for Mac—Everything you need to connect your Mac to the world of on-line information. Includes 2400 bps modem, Smartcom 1.0A, and phone and serial cables in one convenient, easy-to-use package. . . . \$149.

1	Software Ventures 30 day MBG
3455	MicroPhone II 3.0 215.
7	Solutions, Inc 60 day MBG
6720	• FAXGATE Plus 3.0 239.
	Symmetry 30 day MBG
9969	EasyShare 1.2.1
	Synergy 30 day MBG
6618	VersaTerm 4.5 90. 6619 PRO 3.5 177.
7	Zoom Telephonics 30 day MBG
1168	MX2400R Modem (w/QuickLink II) . 85.
1176	MX2400S Modem (w/SendFax 9600) 95.
2310	Fax/Modem FX9624 139.
1179	V.42bis Modem (w/MacPack) 169.
2311	V.32 Turbo Modem (w/MacPack) 439.

INPUT/OUTPUT

MONITORS, KEYBOARDS, MICE, **PRINTERS & SCANNERS**

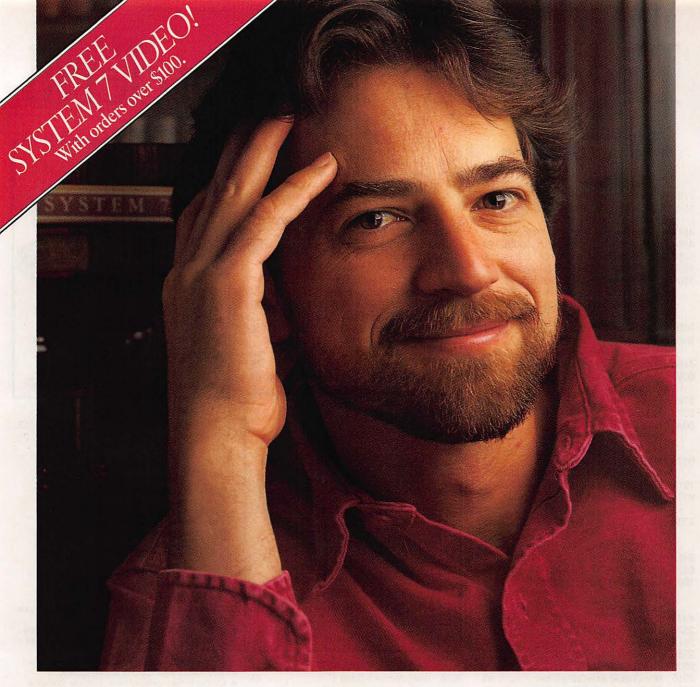
★Abaton ... 30 day MBG

7432 OScan 300/GS (regs. Scan Kit) . . 999. Includes free ProPoint (\$79 value).

1495	Scan 300/Color (regs. Install. Kit) \$12	
1496	Int. Kit for 300/Color w/Photoshop	
1537	LaserScript LX	29.
	ACME/Safe Power Systems	
1948		199.
	Advenced Cravia 20 day MBC	100.
	Advanced Gravis 30 day MBG	
9963	Gravis Mouse Stick	
9964	Gravis Super Mouse	84.
	American Power	
5895	UPS 110SE	209
6686	UPS 370ci	
0000	Applied Engineering	
0700		001
9799		199.
	Bravo Communications	
9813	2 Pos. Laser (compatible switch box)	95.
9817	4 Pos. Laser (compatible switch box)	119.
	Caere	
8124	⊘ Typist 1 1	179.
4476		195.
	Octor Core	130.
*****	CoStar Corp 30 day MBG	
1884	LabelWriter II (September '91) 1	193.
1880		299.
1418	AddressWriter (September '91) 4	169.
1885		89.
	Cutting Edge 30 day MBG	-
^	15" Monochrome monitors for Plus,	
	CE Classic II IIIsi I C	-00
-	SE, Classic, II, IIsi, LC ea. 5 Datadesk 30 day MBG	99.
*	Datadesk 30 day MBG	and others
9830		129.
2384	MAC101E Kybrd. with QuicKeys2. 1	149.
6901	Switchboard (modular keyboard) . 1	159.
*	Everex 30 day MBG	
1144	Silhouette Trackball	82.
1177	GDT Softworks	02.
0050		
6256	PrintLink Collection 4.01	59.
7687	Mac Daisy Link 1.1.7	59.
6151	JetLink Express 2.1	89.
8960	ParaLink Express	99.
	Hewlett-Packard	
6514	HP DeskWriter (incl. cartridge) 5	69
9993	HP LaserJet IIIP (with toner) 11	149.
	LID Laser Let III (with to a a)	
6754		379.
in company	Hitachi	
9492	14" Color Monitor (w/Mac II adaptor) 5	99.
*	Kensington 30 day MBG	
		07.
	Kraft Systems	10000
7519	KM30 ADB Joystick	12
1313	NIVIOU ADD JUYSHUK	42.



Software Ventures ... 30 day MBG 3455 MicroPhone II 3.0—1991 Macworld World-Class Award for Telecommunications. New version of top-selling telecom software. Build graphic front-ends to remote services and corporate mainframes \$215.



System 7? Lon Poole tells all!

As a Macworld Contributing Editor, author of The Macworld Guide to System 7, and allaround operating system aficionado, Lon Poole has been writing a lot about System 7 lately. But the best way to get a writer to really start making sense is to take his hands off the keyboard and put his face in front of the camera. So that's what we're doing—a video of Lon Poole explaining all about System 7 produced at the studios of PCTV®,

somewhere in the wilderness near Marlow, NH.

If you've been trying to figure out what System 7 can do for you, this is a great way to find out. And it's *free to anyone who places an order over \$100*. (Limit one per customer.) Or you can buy a copy for \$9.

By the way, Lon's publisher and accountant asked us to remind you that we'll also sell you his book on System 7 for just \$19. Or buy the book *and* video for \$25. You'll be System 7 savvy in no time.

MacConnection®

MacConnection, 14 Mill Street, Marlow, NH 03456 603/446-7711 FAX 603/446-7791 © 1991 PC Connection, Inc. PCTV is a registered trademark of PC Connection, Inc.

Free with \$100 orders!

ACCESSORIES

RIBBONS, CASES, DUST COVERS

	Apple Computer	
7748	Personal LaserWriter Toner Cart \$89	
1115	LaserWriter II Toner Cartridge 105	
*	Avery 60 day MBG	
4811	Transparencies 81/2" x 11" (Qty. 50) 22	
4807	Laser Labels 1" x 25/8" (Qty. 3000) . 24	
5392	Disk Labels 31/2"-Laser (Qty. 630) 29	
1600	1st Impression (desktop bindery) . 229	
1601	1st Impression First Pack (binder) 57	
7	Basic Needs 60 day MBG	
	Full line of Dust Covers, Stands, etc. ca	
*	Computer Coverup 60 day MBG	
9501	Mac LC w/12" Monitor Cover 10).
9503	Mac Ilsi Ext. w/13" Monitor Cover 10).
	CoStar 30 day MBG	
7453	The Organizer Jr 82	
6091	The Organizer 199).
1	Curtis Manufacturing 30 day MBG	
9742	Tilt & Swivel (MT-1)).
8973	Apple Security Kit (SL-2)	
8046	MVP Mouse (MVP-1)).
	Ergotron	
	MacTilt (Classic, SE or SE/30) ea. 75	i.
9979	MacTilt II (high resolution) 75	j,
*	Goldstein & Blair 30 day MBG	
1913	The Mac Bible Guide to System 7 10).
8374	The Macintosh Bible (with disks) . 25	i.
	IDG Books	
2238	Macworld Guide to System 7 19).
★I/O Design 30 day MBG		
	Available in black (listed) or blue.	
8812	Ultimate Classic Carrying Case 64	
6129	Ultimate SE/Ext. Carrying Case 79	
1941	Ultimate LC Carrying Case 95	i.
7	Kensington 30 day MBG	
	Full line available. Partial listing.	
4973	Power Tree 20 27	
2578	Extra Long ADB Kybd. Cable (7 ft.). 24	
2573	Tilt/Swivel (platinum) 24	
2559	Apple Security Kit	
9303	Keyboard Shelf	
2010	MacClassic Anti-Glare Filter 45	j.
6763	SE Radiation/Anti-Glare Filter 52	2.
5064	Apple Color Monitor Polarizing Filter 63	3.



Sony ... 60 day MBG

Sony's DDS (4mm) data cartridges utilize Super Stable Metal Tape formulation to retain superb reliability and durability. Up to 2GB storage capacity for ultra-high backup requirements. 1603 DG60M .. \$18. 2520 DG90M .. 28.

7	MacConnection 60 day MBG
	Printer & Modern Cables call
1505	Oak Disk Case (36) 21. 4623 (90) 32.
8795	Switch Box (2 Pos.) 32. 8796 (4 Pos.) 49.
*	Mobius Technologies 60 day MBG
4470	Fanny Mac QT (Platinum) 53.
7	Moustrak 60 day MBG
2694	Moustrak Pad (7"x9") 8. 2692 (9"x11") 9.
2693	Moustrak Pad Low Friction (9" x 11") 10.
	Mouse Glove (various colors) ea. 9.
	Ribbons
	Available in black, blue, red, yellow,
	green, orange, purple and silver.
3255	ImageWriter II Black Ribbon 4.
3267	(6 Pak) 18. 9362 (12 Pak) 29.
3261	Image II Multi-4-Color 9. 9810 (6 Pak) 39.
3270	Image II Rainbow Pak (6 colors) 18.
7	Sopris Softworks 60 day MBG
	Ripstop Nylon Dust Covers call.
2009	Mac Classic Economy Case 49.
4014	High Trek Mac SE & Ext. Kybd. Case 69.
-	



Iomega

2224 90 Meg Transportable Drive-Rugged and built to last, this drive will absorb 1000 g's of shock and provide 90 Meg of portable storage. Awards from MacUser, Macworld, Byte, and InfoWorld. Five year warranty. (reqs. kit) . \$799.

	r largus ou day mbG	
8618	ImageWriter II Case	45
900	Lappac 2 Deluxe (for Mac Portable)	55
8617	Mac Classic/Plus/SE Case	59
015	Mac SE & Ext. Kybd. Carry Case	75
7	Tripp Lite 30 day MBG	
100	Isobar A (surge suppressor 4 outlets)	40

6200 Isobar 6 (surge suppressor, 6 outlets) 59.

STORAGE MEDIA

7	Fuji 60 day MBG
2214	31/2" DS Disks (10) 11. 2242 (50) 49.
2215	31/2" HD Disks (10) 18. 2241 (50) 79.
	31/2" DS Disks Color (10) 12.
2239	31/2" HD Disks Color (10) 19.
7	MacConnection 60 day MBG
6592	44 MB Cartridge 74. 9728 (10) 699.
7	Sony 60 day MBG
3297	31/2" DS Disks (10) 11. 6148 (30) 29.
3298	31/2" HD Disks (10) 18. 6375 (30) 49.
8185	QD2040 Tape Cartridge 19.
1603	DG60M (DDS 4mm, certified 1.3GB) 18.
2520	DG90M (DDS 4mm, certified 2GB) 28.
7	+3M 60 day MBG
3943	DC2000 40 MB Data Cartridge 19.



Hewlett-Packard ... 1 year 6754 HP LaserJet III-Exclusive Resolution Enhancement technology with 300 dpi sets a new standard. Prints up to 8 pages per minute as well as holding up to 5 meg of memory. Scalable typefaces and more built in . . . \$1679.

★MAXELL 60 day MBG		
792	31/2" DS Disks (10)	13
793	31/2" HD Disks 1.44 MB (10)	21

OUR POLICY

- We accept VISA and MASTERCARD.
- No surcharge added for credit card orders.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order
- No sales tax, except Ohio residents (please add applicable tax).
- All U.S. shipments insured; no additional charge.
- APO/FPO orders shipped First Class Mail.
- International orders U.S. \$250 minimum. Manufacturer support and upgrade eligibility may be limited outside the U.S.A
- Upon receipt and approval, personal and company checks clear the same day for immediate shipment
- Corporate P.O.s accepted subject to credit approval.
- COD max. \$1000. Cash or certified check.
- 120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. All items subject to availability. Prices and promotions subject to change without notice.
- Our order lines are open continuously from 8:00 a.m. Monday until 5:30 p.m. Saturday Eastern Time. You can call our business offices at 603/446-7711 Monday through Friday 9:00 a.m. to 5:30 p.m. Eastern Time.

SHIPPING

Continental US: Barring events beyond our control, all credit card orders phoned in weekdays by 3:15 a.m. Eastern Time will ship Airborne Express for delivery the next business day. Which means same day delivery for orders placed between midnight and 3:15 a.m. Eastern Time. (Some orders may ship by UPS Ground for next day delivery). Saturday delivery available to many areas upon request. Some areas require an additional day delivery. The total freight charge on any order placed with MacConnection is only \$3

Hawali, Alaska, Canada, Puerto Rico and U.S. Virgin Islands: Call 800/334-4444 for information on shipping and charges

All other areas: Call 603/446-7711 or FAX 603/446-7791 for information.

that has to be seen.

★Logitech 30 day MBG 1671 MouseMan\$77	
1672 TrackMan 89	
5082 ScanMan Model 32 G-Scale Scanner 299	
★MicroSpeed 30 day MBG	
6620 MacTRAC (for 512, 512E & Plus) 62	
6621 MacTRAC ADB (for SE & II family) 75	
★Microtek 30 day MBG	
1981 MS-II OCR Scanner 849	
1978 Scanmaker 600GS 1199	
1985 Scanmaker 600ZS 1599	
1982 Scanmaker 1850S 2299	
Monster Design Group	
1486 MacSpeakers (two, stereo) 175	
★Mouse Systems 30 day MBG	
7560 Trackball ADB	
Little Mouse or Little Mouse Plus. ea. 74	
9471 A ³ Mouse 85	
★Nutmeg Systems 30 day MBG	
19" for SE, SE/30, II, Ilsi ea.995	
₱ 19" for GrayScale SE/30, II, Ilsi . ea. 1295	
₱20" Color System: SE/30, II, Ilsi ea. 2595	
★Orange Micro 30 day MBG	
3036 Grappler 2.0 (9 pin) 92	
6229 @Grappler LX	



Datadesk ... 30 day MBG

9830 MAC101E Keyboard—Latest version featuring function keys, click-click tactile sensation, six separate screen control keys, a numeric keypad and isolated Esc and Reset keys . \$129. 2384 MAC101E Keyboard with QuicKeys²....149.

7	Pacific Data 60 day MBG
7412	Pacific Page (PE) 529. 1473 (XL) 979.
7	Sophisticated Circuits 30 day MBG
8009	PowerKey 1.01 64.
8008	PowerKey Remote 32.
	TheComplete PC
6104	Half-Page Scanner/400 289.
	Thunderware
4994	LightningScan 400 385.

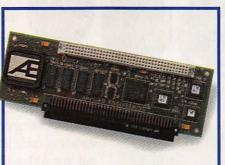
UPGRADES & DRIVES

MEMORY, ACCELERATORS

	SIMMs with free video
1107	1 MB SIMMs (80ns) 49.
8316	1 MB SIMMs (80ns, set of 2) 95.
9437	2 MB SIMMs for Ilsi or II LC 129.
	Applied Engineering
1971	FastMath LC
8361	1.44 MB High Density Drive 229.
2532	QuickSilver (32K cache card) 309.
	MacRam Classic with 0, 1, or 3 MB. call



,	Cutting Edge 30 day MBG
3989	800K External Disk Drive . special 119
5456	44 MB Removable Drive 599
3990	30+ MB Hard Drive
3991	45+ MB Hard Drive 379
5275	60 + MB Hard Drive 399
5276	80 + MB Hard Drive 469
1213	52 MB Hard Drive (Quantum) 439
1569	
1573	185 MB Hard Drive 899
1217	
7	Dayna 60 day MBG
8723	DaynaFile II 360k Drive 449
8722	DaynaFile II 1.2 51/4" Drive 449
	DaynaFile II Dual 360k & 1.44 MB 739
7	DayStar Digital 30 day MBG
	Listed items do not include coprocessor
	LT200 Connection (PC) 189. (MC) 299
8556	
	25 MHz PowerCache 030
	for SE/30, II, IIx, Ilcx, LC 749
	40 MHz PowerCache 030
	for SE/30, II, IIx, IIcx, IIci, IIsi, LC 949
	50 MHz PowerCache 030
	for SE/30, II, IIx, IIcx, IIci, IIsi, LC . 1689



Applied Engineering

2532 QuickSilver Accelerator for the Ilsi—Gives your Mac Ilsi speed and expandability with an SE/30 slot extender, a cache card and a 68882 math coprocessor chip on board. Comes with a 5 year warranty \$309.

1970	Ram PowerCard (regs. memory). \$749.
	SCSI PowerCard (regs. memory). 1095.
	Fifth Generation 30 day MBG
9403	
9809	
7	FWB, Inc 30 day MBG
2320	HammerDisk44 (removable) 759.
2331	PocketHammer50 599.
2329	PocketHammer100
2314	PocketHammer200
2341	Hammer50is (internal) 469.
2333	Hammer100is (internal) 699.
2334	Hammer200is (internal) 1199.
	Iomega
7551	44 MB Transportable (regs. kit) call
2224	90 MB Transportable (regs. kit) 799.
2467	Gold Std. Rem. Disk (90 MB, tri-pak) 439.
	Mass Microsystems
2605	DataPak (45 MB removable) 699.
2599	DataPak 88 Classic call
4	Micron 30 day MBG
7149	Xceed Ilci-128K Cache Card 239.
6680	Xceed for SE/30 (640 x 480) 279.
2262	Xceed Color 30 Card (SE/30) 279.
2263	Xceed MacroColor II Card (Mac II) 469.



Sigma Designs

1501 Double Up—Compress data, image and application files. Hardware compression accelerator. Includes best selling Disk Doubler 3.7 software. For Mac NuBus computers. Rated fastest by Mac WEEK.............\$185.

	Peripheral Land, Inc. (PLI)
8335	PLI TurboFloppy 1.4 309.
8333	PLI Sony 40 Turbo Ext. Drive 419.
8334	PLI SuperFloppy 449.
8327	PLI Infinity 40 Turbo 699.
9752	PLI Infinity 88 Turbo 999.
9862	PLI Infinity 40 Twin
8330	PLI 105 MB Ext. Drive 699.
8329	PLI 200 MB Ext. Drive 1159.
2327	PLI 2GB DAT Drive 2059.
1866	Quick SCSI Card
	Sigma Designs
1501	DoubleUp
1	Total Systems 30 day MBG
8989	High Speed SCSI for Mercury 16+ 209.
7817	16 MHz Mercury 030 (for Mac SE) 359.
8624	16 MHz Mercury 030 (for Mac Plus) 489.
7816	20 MHz Gemini 030 799.
8708	25 MHz Gemini 030 1089.
7814	33 MHz Gemini II 030 1375.
8371	40 MHz Gemini II 030 1499.
	20 - 40 MHz Gemini Classic cal
	68882 Math Coprocessors cal

THE ONLY 8MM TAPE DRIVE THAT CAN MAKE CHANGE.



IT MAKES CENTS. Take the magazine you're reading. To fill a single 8mm tape, you could backup every issue of MACWORLD for the next two years. A single issue costs

just about 33 cents to store. Consider that you're spending less time backing up more data, and you're no longer dealing with small change.

Using our high speed, high capacity 8mm tape drives will save you time and money in manhours, media, storage, and shipping costs. In fact, our drives give you the lowest cost per megabyte

on the market. On lightweight, reliable media. That is fast becoming an industry standard.

TRUE "PLUG-AND-PLAY" COMPATIBILITY WITH:

Alliant **DataGeneral** Mainframe IBM Alpha Micro Novell Sequent Altos **DEC BI-Bus** 05/2 Silicon RISC/6000 PS/2 PC 386/ix Apollo DEC HSC Graphics Arix **DEC Q-Bus** IBM RT Sun PC MS-DOS Unisy PC Xenix/Unix Wang DEC TU/TA81 AT&T **IBM S/38** Unisys **DEC Unibus** Basic-4 Macintosh Concurrent Gould/Encore McDonnell Pertec and more Plexus Convergent Douglas **IBM AS/400** Prime

AND IT MAKES SENSE. The menu driven software features a calendar for automatic operation. Schedule a backup to run at any time, day or night. Choose an incremental or complete backup. The software's directory will keep track of every file that you've saved. To restore a file, simply

pull up the directory and click on the file you want; if you want to create space on the hard drive, just

copy selected files into the archive. Compatible with all Macintosh models

including systems running A/UX, our drives give you between 2.5GB and 25GB of storage per tape. Features like a liquid crystal display, data compression, data encryption, and high speed search capability give our drives the flexibility to adapt to your changing needs. We can meet any site requirements with rack mounting options, hard disk configurations, and a variety of cable lengths. And we back every product in our line with a 12-month warranty and technical support.

It doesn't make cents to wait. Call today for more

information at 804/873-9000.





Why I'm Blue

STRANGE BEDFELLOWS AND THE END OF A DREAM

unny kind of world we live in. Every time

BY STEVEN LEVY

you feel you've seen its worst, that you've shielded yourself from its slings and arrows, that you've observed the low points

in human behavior and understand perfectly that the average

person lacks the morals of a zebra mollusk, something wallops you upside the head and tells you things are much, much worse than you suspected. *Welcome to Chinatown, Jake*. And you realize that despite your hard-won cynicism, you are but a rube without a clue, a widowed grand-mother waiting outside the bank for the nice man who said he was a cop to return the life savings he borrowed in order to catch a crook.

That was the way I felt when I read about the ongoing negotiations and recent agreement between Apple Computer and International Business Machines to work together.

Rainbow and Blue

Hey, I should have known better. It's not like Apple Computer of late has been a model of the idealistic New Age company that its founders promised back when they were still within psychic shouting distance of the garage where it all began. Apple Computer is a serious business, raking in a billion bucks every quarter. You would have to be a tree stump to believe that the leadership of Apple doesn't participate in the short-term



greed-ridden mentality so pervasive in American business. The company is awash in meaningless reorganizations, energy-draining lawsuits, and cushy executive payouts, all while its technological leadership drip-drip-drips away.

It's also common knowledge that as Apple gets bigger, older, and richer, it more and more resembles Big Blue, the faceless, white-shirted mob that dominates the industry from its headquarters in New York. Apple hires executives who worked at IBM, and it cultivates a sheen of blandness to court corporate minions who kneejerk their buying decisions in the direction of Armonk.

This tendency on Apple's part has always been disturbing because IBM still stands as a symbol of the

> days when computers lived in air-conditioned fortresses and not on people's desktops. IBM believed that computers should be handled only by a high priesthood that Knows More Than You Do. It kept the productivity, not to mention the joy, of computing away from those who could mightily benefit from it. If IBM had its way, we'd

still be handing stacks of punched cards to pocket-pencil geeks.

IBM may tempt us with a good product or two (for its time, the IBM PC was quite a nice piece of machinery), but ultimately it shows its true loathsome face with something like the PC Junior or the hideous Presentation Manager, thus revealing that IBM never *got it* in the way Apple did so effortlessly. Computers are all about transcending limitations, and IBM is all about limiting computers (continues)

for its own dark corporate purposes. If it were in the company's own interests, IBM would bend our heads, spindle our best efforts, mutilate our hopes.

We *know* what IBM stands for. And just in case we forgot, IBM's chairman, John F. Akers, recently sent out a missive reminding his wingtipped warriors, exactly what Big Blue is and has always been about. According to several newspaper accounts. Akers wrote:

"IBM exists to provide a return to its shareholders... These facts of business life are as plain now as they were more than 45 years ago when Thomas J. Watson Sr. reminded people of them, saying, 'It becomes increasingly apparent in my small sphere of observation, and I conclude the company as a whole, that the average IBM'er has lost sight of the reasons for its company's existence. IBM exists to provide a return on invested capital to the stockholders.'

No wide-eyed rap about technology empowering people. No politically correct, technologically hip college teacher pep-talking students about a new Industrial Revolution with a chicken in every pot and a mouse on every desk. No promise to deliver cool product. We're IBM, baby, and the bottom line is the bottom line.

The Mission

Apple Computer, of course, is a profitmaking enterprise, too, and I wouldn't have it any other way. But from the first, it seemed to hold a promise that this was capitalism with a human

As Apple gets bigger,
older, and richer,
it more and more
resembles Big Blue, the
faceless, white-shirted
mob that dominates
the industry

face—that little smiley guy who tells you, "Welcome to Macintosh." Apple was a company with vision, a company with a mission. It was going to make life better. It was going to make computers for the rest of us.

What did they mean by "the rest of us"? The people who hate IBM.

It was a mission that inspired passion. Apple led a revolution in personal computing—a big glorious gob of spit in IBM's face. When Apple made its stand, in the glory days, everything changed. Ask the people who worked for Apple in its first decade—were they knocking themselves silly for 90 hours a week to provide a return for stockholders? Suggest that concept to them and they would regard you as a kitchen cockroach, suitable for stomping (continues)



Our "Smart Cursor" auto

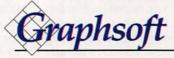
develop cost estimates.

Our "Smart Cursor" automatically highlights, identifies and aligns relevant snaps, intersections, tangents and parallels. Snap to the precise point with more ease than you've experienced with any other program. We built the brains into MiniCad+ so you can think about more important things.

calculations, compile parts schedules and

Draw On Our Experience

Packed with features, the only thing small about MiniCad+ is the price. As a professional, you owe it to your desktop to ask your favorite distributor for the 1990 MacUser Editor's Choice winner in CAD, or call us for more information.



8370 Court Ave., Suite 101 • Ellicott City, MD 21043 • (301) 461-9488 • FAX (301) 461-9345

QuickSCSI

HAS A DUAL PERSONALITY

Faster SCSI

Improve your Mac's SCSI performance by up to 400%.

Eliminate the SCSI bottleneck. QuickSCSI allows data transfer rates up to 4.4MB/sec. and beyond. That's more than twice

as fast as the Mac's built-in SCSI, because QuickSCSI uses a

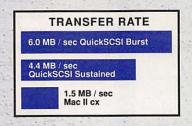
> wider data path. And because QuickSCSI doesn't disable the built-in SCSI, you can have up to 14 SCSI devices online at a time.

Set-up is easy, because QuickSCSI is compatible with most popular disk drives, including internals.

And you can install it in any NuBus Macintosh.

Get all the performance your fast drives can give, use QuickSCSI.

*\$599 suggested

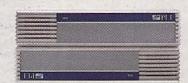


retail, \$399 when purchased with a PLI drive.

Mirroring

QuickSCSI provides automatic, continuous backups.

Everything you write to the main drive will be



written to a second drive at the same time. If one drive crashes, you can

bring the second drive online in seconds.

You never have to Re-create data or waste time restoring.

Mirroring is by far the safest, most-reliable way to maintain current backups of your important data. And QuickSCSI uses a fast-burst, disk mirroring technique which is so fast and easy, you may never do a traditional backup again.

Mirroring is useful to everybody.

It's ideal for network administrators, desktop publishers, computer artists or anyone who hates to make backups. \$399*



Peripheral Land Incorporated /47421 Bayside Parkway /Fremont, California 94538

415 .657 .2211 800 .288 .8754 Fax 415 .683 .9713

Macintosh is a registered trademark of Apple Computer.

upon and nothing more. They wanted to change the world.

Not everyone at Apple bought the mission whole hog. But enough Apple workers did to make the company something special, not only to its workers but also to its customers. To those of us who believed in the mission, Apple Computer meant something. We paid a price for it.

The czars at Apple, from Jobs to Sculley, knew the blindness of our devotion and milked it for all it was worth. They tested our patience. They charged too much for their products, they hoarded their sometimes questionably begotten software licenses, they acted in too many ways like the very companies they said they were different from. But we hung on, through overpriced computers, faulty power supplies, hubris-laden boardrooms, and nonexistent notebook computers. We continued to keep the faith, even when Apple's leaders didn't. We were buckled in for the whole ride.

Our continuing loyalty was based on two factors, intertwined like the bushes on the graves of Tristram and Isolde: Apple's products, by and large, were great. And no matter what else was wrong with the company, Apple Computer was not IBM.

Although often distracted by executive misdirection, Apple never really forgot that besides making money, there was a mission at stake. You could see this in its products, which more often than not displayed a useful amiability, and you could see this in the spirit of its employees, most of whom realized that the best part of working at Apple was participating in the mission.

Apple knew that not being IBM was one of its prize assets, and the company sang that song from the rooftops. Apple ran commercials showing IBM customers walking off cliffs in their three-piece suits. Lemmings, I believe Apple called those Blueheads. Then it ran commercials of people frustrated with their IBM

PCs and bashing the things, in one case even taking a chain saw to the beast. At Macworld Expo, stockholder meetings, and random pep rallies, wherever Apple screened these promos, people stood up and cheered. For one sales meeting, Apple even hired the guy who sang "Ghostbusters" to redo the song, only this time the who-you-gonna-call were the "Bluebusters."

No matter how bad things got—with Apple suing just about everyone in sight for allegedly appropriating its interface, and with System 7 late, a Portable that sucked fish, the whole Macintosh development team in exile, and the corporate staff at Apple looking like an outtake from a Leni Riefenstahl movie—we still had one important thing to fall back on. It wasn't IBM. Envisioned geographically, there was the continent of Apple and the continent of IBM, and between them a gulf that would never be crossed.

(continues)

Fred Fall Sphere Rings foat Sides Lake Section Fall Sphere Rings foat Sides Lake Fred Fall Sphere Rings foat Sides Rings foat Sides Lake Fred Fall Sphere Rings foat Sides Ri

**Provides the highest degree of functionality and the best on-screen and printed graphic ability in its class." *MacUser, October 1989.*

So much to schedule -so little time.

Create and Update Presentation Quality Gantt Charts quickly and easily! Just draw activities right on screen, customize your bar types and add labels, graphics, text blocks and multi-level sub-activities. When you need to make changes to your schedule, updating is a SNAP!

Some features:

- Schedule in hours, days, weeks, months, quarters, years, fiscal years and generic formats.
- Display start and finish dates in columns, or align to bars.
- · Display multiple activity columns.
- · Import and export data.
- · Much, much more!

Please call for your **FREE** interactive demo kit! (800) 346-9413 or (703) 450-1980.



Circle 83 on reader service card

Flips, somersaults and handscans.

ow there are three LightningScan models. So everyone can perform great feats of graphics. LightningScan 400 is the top-rated scanner for all Macs. And now we've introduced the Compact for Mac Classic, SE/30, SE with SuperDrive[™] and Portable. And the Pro 256 for any Mac II or LC.

They're fun, easy-to-use and feature the exclusive SnapGuide® system for straight scanning. And ThunderWorks®. The awardwinning software that lets you alter images with a troupe of handy tools.

Flip. Rotate. Enlarge. Reduce. Control contrast and brightness. Scan and join a page in just two passes. With no distortion. Create special effects. Draw. Filter. Re-size. Dither. Then print your art or save it to import into most programs-

1111/2

even OCR.

"If you need a hand-held scanner...we recommend the Thunderware LightningScan." -MacUser (9/90)

For starters, LightningScan 400 and LightningScan Compact are ideal for adding graphics to newsletters, reports, flyers and announcements. And despite its impres-

sive features, the Compact has a street price under \$300.

For professional results, the Pro 256 is the world's most powerful hand-held scanner. It's great for layouts and comps. And with 256

shades of true gray, it's even better

for creating high-quality halftones. For speed, control and creative expression, the Pro 256 scans alone.



Do flips, rotations and special effects with ThunderWorks software.

Whether you're looking for low-cost graphics, or a powerful imaging tool, you can't beat LightningScan. To get your hands on one, see your Mac retailer or call us today for our demonstration video.

JANDSTAND PERFORMS Add handscanned graphics to your Mac documents.

Lightning Scan

21 Orinda Way, Orinda, CA 94563-2565 (510) 254-6581, FAX (510) 254-3047, Orders: (800) 445-1166

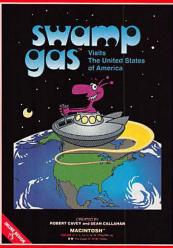
ThunderWorks is System 7 compatible, LightningScan 400 runs on all Macs. LightningScan Compact runs on Macintosh Classic, SE/30, SE with SuperDrive, and Portable. LightningScan Pro 256 requires a Macintosh II, LC, or SE/30, four Mb suggested. LightningScan, SnapGuide, ThunderWorks, Thunderware and its logo are registered trademarks of Thunderware, Inc. Macintosh and SuperDrive are trademarks of Apple Computer, Inc. © 1991, Thunderware, Inc. All rights reserved.

GET INLINE FOR A GOOD TIME!

NEW from Inline Design: 3 in Three by Cliff Johnson, an animated fullcolor adventure that shows you a side of your Macintosh that you never dreamed of.



And Swamp Gas, a charmingly wacky geography game for all ages, with arcade-style rewards for good performance.



From the folks who brought you Darwin's Dilemma and Tesserae, the stunning, enticing color puzzle games that will keep you and your Macintosh entertained for hours.

ALL GAMES SYSTEM 7 COMPATIBLE

Fully compatible with all Macs from the Plus to the Ilfx, including the new Classic, LC, and Ilsi.
No copy protection.

INLINE DESIGN 5 West Mountain Road, Sharon, Connecticut 06069

For more information, or the location of a dealer near you, call (203) 364-0063

Circle 111 on reader service card

The Betrayal

That's all over now. The Bluebuster T-shirts apparently have been stuffed into garbage bags and shuttled off to Goodwill. John Sculley and his white-bread lieutenants have huddled with the former forces of evil and emerged with an agreement that spells the end of an era.

Read it and weep, those of you who believed the dream: Apple and IBM are forming a joint venture to create the next generation of operating system, successor to the Macintosh. They may even sell each other's products. This is something that Nostradamus might have predicted as a sign of the apocalypse, the lion lying down with the lamb and all. But there it is.

Apple Computer can no longer lay claim to its aura of specialness—that quality was left in some conference room in Armonk, destined to spend eternity in the lost-and-found of good intentions. Bill Gates got it right when he said, "What's left? Apple has sold off its birthright . . . and that's sad."

Gates, of course, is the odd man out in this alliance, which was presumably motivated in part to fight Microsoft's increasing power in the personal computer industry. But he speaks the truth. The agreement is not only the biggest betrayal of its loyal customers in all Apple history, but also a signal that one of the pillars, if not the major pillar, of Apple's mission is hereby toppled. Apple can no longer say that it's not like IBM. Because in an essential way, it now is IBM.

Some industry analysts are applauding the agreement, saying that the strategic alliance will work for both companies. Others are warning that Apple may be lured into making a deal that ultimately will not serve its interests. Anyone with brains is wondering how the two company cultures will mesh. But at this point, I don't care about whether the deal works or doesn't work—the soul of Apple is no more.

What will Apple stand for if its products become interchangeable with those of IBM? What were the lords of Apple thinking to even consider this? Don't they understand that Apple, despite its inclusion in the fraternity of corporate giants, still retains some of its sheen precisely because it stands as an alternative to the mind-numbing dominance of IBM? And that entering into a partnership with IBM on such critical matters is no less than a blood betrayal of the faithful? Down through the years, Apple's mission has eroded, but this is different—it means that there's no mission at all. It's Chinatown, Jake—let's get out of bere.

Orwell Redux

Remember Apple's great commercial introducing the Macintosh (another IBM-bashing spot, by the way), where the agents of repression were de-

Apple led a revolution—
a big glorious gob
of spit in IBM's face....
A partnership with
IBM is a blood betrayal
of the faithful.

stroyed by superior interfaces and we were promised that "1984 won't be like 1984"? If you reread the book that made that annum so notorious, you will find that the fictional world therein has three large nationalities, each of which is always at war with one and allied with another. The opposing nation is always referred to as a demonic, horrible, subhuman force that deserves no less than total destruction. But then, with no warning or explanation, that war is called off, and a new war initiated with the third entity. This new opponent is referred to with the same dehumanizing cant. And the country that for years had been considered a satanic blight on humanity? Suddenly, our ally!

And that is why 1991 looks like 1984. Apple, please—say it ain't so!

Macworld columnist Steven Levy is writing a book on artificial life.

LA CIE OR MICROTEK SCAN. SEE THE DIFFERENCE IN BLACK & WHITE. AND COLOR.

Microtek Scan

Original: 8 x 10 B&W print

Brightness level:

Input resolution:

150 dpi Size: 403K

Output Resolution: 200 dpi

Line Screen: 150 lpi

Gamma Correction: None





Silverscanner Original: 8 x 10 B&W print Brightness level: Input resolution: 150 dpi Size: 419K Output Resolution: 200 dpi Line Screen: 150 lpi Gamma Correction:

Microtek Scan

Original: 8 x 10 color print Brightness level:

Input resolution: 150 dpi

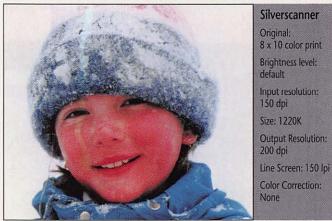
Size: 1201K

default

Output Resolution: 200 dpi

Line Screen: 150 lpi Color Correction: None





Silverscanner

None

Original: 8 x 10 color print Brightness level: default

Input resolution: 150 dpi

Size: 1220K

Output Resolution: 200 dpi

Color Correction:

hen it comes to selecting the right scanner, be forewarned.

There is a difference you can see in black and white. And color. Just look at this comparison between the La Cie Silverscanner and the Microtek 300ZS. Both images were scanned at default settings with no corrections. This entire ad was then created and separated using Adobe Photoshop, Quark XPress 3.0 and a Linotronic 330.

As you can see, Silverscanner produced a better-looking image than the Microtek scan. Silverscanner lets you scan color, gray-scale, halftone and line art with dazzling clarity. La Cie gives you more with OCR compatability, faster color previews, versatile scanning controls and up to 1200 dpi.

La Cie Silverscanner

La Cie Silverscanner: 16 million colors; 256 smooth shades of gray, production quality line art; up to 1200 dpi-all in a single pass.

FREE Software. Silverscanner comes with two FREE bonuses: Adobe Photoshop (full version) and La Cie's exclusive Silverscan plug-in modules for Photoshop, ColorStudio, Digital Darkroom, Enhance 2.0, ImageStudio and Ragtime.

A Company You Can Count On. La Cie is a Plus Development Company, backed by \$400 million in assets. That means you can trust La Cie to provide a constant source of high-quality Macintosh peripherals. Plus dependable service and support.

Silverscanner is the color scanner you've been

looking for. See for yourself. Order yours today.

To order or for more information, call toll-free 800-999-0143



The Macintosh of the future is

Introducing the System 7 Personal Upgrade Kit.

You've read and heard a lot about System 7, the new system software for Apple® Macintosh® computers.

And if you already know what it will do for your Macintosh, perhaps the only other thing you need to know is this: Your System 7 Personal Upgrade Kit is ready.

You can order it right from the next page, or from your authorized Apple reseller. Just proceed to the phone

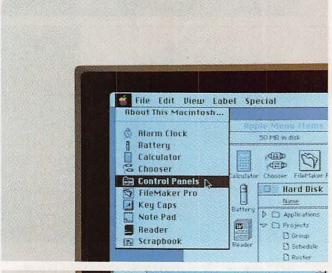
What's on the Apple menu? You decide, by dragging any document or application into the Apple Menu Items folder. To open it, just click. And for a quick way to see what's inside a folder, click the triangle next to it.

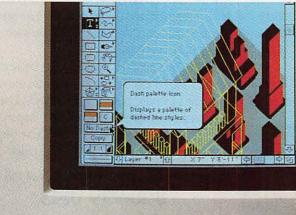
number above the coupon. But if you'd like a reminder of what System 7 is all about, please read on.

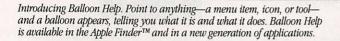
More powerful capabilities. More ease of use.

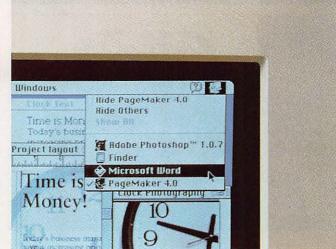
That's what System 7 brings to your Macintosh. As soon as you install it, you'll enjoy an array of new capabilities, and be ready for a new generation of software. And since System 7 runs virtually all current applications, you'll enjoy its benefits without giving up a thing.

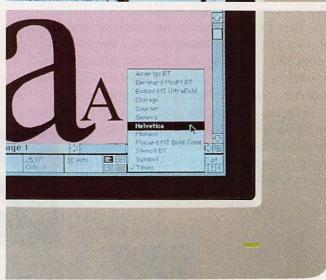
With enhanced multitasking, you can keep several applications open at once, and continue to work while you print, search for, copy, or share files. Thanks to virtual memory, multitasking capability isn't limited by the amount of RAM.











With TrueType, even the largest letters display perfectly on the screen, with no jaggy, "staircase" edges. You also get terrific printed output with almost any kind of printer. And System 7 is compatible with the fonts you already have.

the Macintosh on your desk.

We've also made Macintosh easier to use. For instance, take a look at Apple Balloon Help, our new on-line help feature. Point to an item on the screen, and a balloon pops up next to it, telling you what it's for. So applications are quicker to learn, and easier to make the most of.

Everything gets smoother and simpler.

With System 7, there's a big improvement in big type. Thanks to Apple's TrueType™ font technology, you get perfectly smooth letters on the screen, no matter what their size, along with more professional-looking output. And you don't need the Font/DA Mover. To install TrueType fonts, just drag their icons into the System Folder. (Ditto for desk accessories.)

Open an application. Work. Save. Quit. Open another application. Until now, that's how you've probably moved from, say, a word processing program to a spreadsheet. With improved multitasking, you can keep several applications open at once, and choose between them with a mouse click. So you don't have to stop what you're doing to print, search for files, duplicate files, or share data.

Using applications simultaneously can demand lots of memory, but with System 7 you aren't likely to see a not-enough-memory message. Because there's virtual memory.* When you need extra memory, just tell System 7 to use the spare room on your hard disk. Your Macintosh will work without interruption, and so will you.

See what's developing.

System 7 gives developers a far-reaching new set of tools, enabling them to offer applications that do new things for you. For example, to the fame and success of cut and paste, we've added publish and subscribe. Change something in one document, and it can change—automatically—in every document where it appears. Even if the documents are in different applications or on different computers across a network.

System 7 also enables any Macintosh on a network to share documents and applications with any other.

We could go on. But the main point is really this:

System 7 is ready for your Macintosh.

To run System 7, all you need is 2 megabytes of memory and a hard disk. (If you don't have enough memory, you can purchase it from your authorized Apple reseller.)

System 7 sets new standards in personal computing, and so does the way Apple brings it to you. To make installation simple and sure, your System 7 Personal Upgrade Kit** comes with everything you need—disks, manuals, and 90 days of telephone upgrade assistance. Yet your System 7 Personal Upgrade Kit costs only \$99 (plus shipping and handling).†

Which, of course, brings us to the matter of getting System 7 into your hands, and onto your Macintosh, as soon as possible.

Call the toll-free number below. We'll take your order, or give you the name of an authorized Apple reseller. Or you can mail the accompanying form. And let System 7 give you even more of what Macintosh has always given you. The power to be your best.*

You can order System 7 from this page, or from your Apple reseller.

Call 1-800-654-1068, ext. 330

	nd 90 days of telephone upgrade assistance.
Name	
Company	
Address(Street address only—no P.O. box)	
City	StateZip
Your daytime phone number	
	ced without sales tax must be returned.
Number of kits ordered	Total cost (\$99 per kit)
	Applicable sales tax
	Shipping (\$7.50 per kit) TOTAL DUE
Card no. Cardholder's name	The series of th
Cardholder's signature	
System Same Same Same Same Same Same Same Sa	June 2002
Month of Section of Se	2 20 20

Allow two to three weeks for delivery

Offer good only in the United States. Offer expires December 31, 1991.

Upgrade *your* Mac's performance with DayStar Power... now!



Product IIx IIcx IIsi IIci IBM FastCache 25 MHz PowerCache 40 MHz PowerCache Math Chip Math Chip 50 MHz PowerCache SCSI PowerCard 0, 1, 4, 16 MB Cache RAM PowerCard 0, 8, 16, 64, 256 MB LT200 Connection MC or PC

When it comes to performance, DayStar is the upgrade company. We deliver 100% compatible performance upgrades for your Mac.

Whether you need 25, 40, or 50 MHz performance with our new PowerCache, or an economical boost with the FastCache... we have an upgrade to fit your budget. You can work up to three times faster!

If you're already running full steam, then our RAM PowerCard™ and SCSI PowerCard™ can make your diskintensive tasks scream. Perfect for databases, imaging, accounting, programming, and optical drives.

Or, with our LT200 Connection, you can even connect PC's to your AppleTalk® network!

Peace of mind with DayStar.

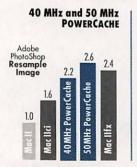
Our upgrades are designed for years of trouble-free service. If you ever need assistance, we provide toll-free technical support. Plus, we protect your investment with our innovative Swap-Up Program. You can move up your product's line anytime, just for the difference in list price. And, don't forget to ask about the 30 Day Money-Back Guarantee!

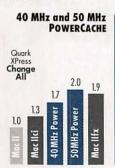
Go ahead, get the speed you need at a price you can afford. Come join us!

800-962-2077 available through better dealers everywhere!

Circle 201 on reader service card

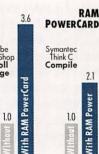
HOW MANY TIMES FASTER?

















SCSI

DayStar Digital, Inc., 5556 Atlanta Highway, Flowery Branch, GA 30542 International: (404) 967-2077, Fax: (404) 967-3018 · This ad was completed on a Mac with DayStar upgrades installed.



Electromagnetic Update

THE CONTROVERSY—AND RESEARCH—CONTINUES

BY DEBORAH BRANSCUM

hile the computer industry has moved fairly quickly to respond to consumer concerns about low-level electromagnetic fields (see "Seeking ELF Relief," this issue), there's still more controversy than consensus in the scientific debate about

whether such fields are harmful. Three recent studies fail to settle the debate, and add more questions.

Conducted by the University of Southern California, a soon-to-be-published epidemiological study of 232 childhood leukemia cases and 232 controls shows a link between leukemia and household-wiring configurations. That link confirms the observations of two earlier studies done in Colorado. But unlike the earlier work, USC's study, overseen by Dr. John Peters, also measured electric and magnetic fields in various areas inside and outside each home, and measured magnetic fields for at least 24 hours in each child's sleeping area.

Wiring configurations—which refer to the relationship between the number, capacity, and distance of power lines to houses—had been thought to represent electromagnetic field strengths within particular homes. If that were true, researchers who found a relationship between wiring configurations and leukemia risk should find a correlation between actual household measurements of electromagnetic fields and leukemia risk as well. But according to a summary of the USC study, the research

data "offer no support for a relationship between measured electric field exposure and leukemia risk, little support for a relationship between measured magnetic field exposure and leukemia risk, some support for a relationship between wiring configuration and leukemia risk, and considerable support for a relationship between children's electrical appliance use and leukemia risk."

(The electrical appliance risk referred to involved the use of hair dryers and black-and-white TVs among a small number of children. No one knows if the short-term, very high exposure of children to the fields from these appliances is actually responsible for the observed risk.)

There is no one explanation for the puzzling results of the USC study.

The Palo Alto, California-based Electric Power Research Institute (EPRI) is a power-utilitysponsored research organizathat spending some \$9 million this vear on studies in this area, including USC's. Dr. Stanley Sussman of EPRI suggests several possible explanations for the study's find-

ings: (1) that the field measurements weren't taken over a long enough period to be meaningful; (2) that the critical element linking electromagnetic fields and leukemia risk wasn't registered by the measurements; (3) that wiring configurations don't represent electromagnetic fields but some other element such as traffic patterns or housing density that somehow contribute to an increased risk for leukemia; or (4) that a design flaw in the study suggests a false as-(continues)

From Dull

to



with



...our dynamic effects
will add
punch and excitement
to any document or
project.



Includes these great features:

- Use any font in your system, PostScript[™] or non-PostScript
- 120 different effects, each with its own modifiers
- · Easy to learn...easy to use
- Imports and exports PICT and EPSE files
- · WYSIWYG
- Kerning, scaling, color and background generator
- · Rotating and skewing
- · Rulers, group and ungroup

FREE Adobe TypeManager™ and 13 Adobe® fonts with purchase

Call now for free Demo Disk



27811 Avenue Hopkins, Suite 6 Valencia, CA 91355 • (805) 257-1797 sociation between wiring codes and leukemia risk.

The questions raised by the USC study are more urgent than ever in the wake of a report released in June by the National Cancer Institute (NCI) in Bethesda, Maryland. Some scientists argue that if electromagnetic emissions affect leukemia risk, there should be an increase in cases. The NCI report shows an overall increase of 4.1 percent in cancer rates among white children age 14 and younger between 1973 and 1988.

Even with the increase, the total numbers are still quite small. The same NCI report shows that the rates of acute lymphocytic leukemia, the most common childhood cancer, increased between 1978 and 1988 by more than 10 percent, to 3.2 cases per 100,000 from 2.9 cases. Brain tumors, the second most common childhood cancer, were up more than 30 percent, to 3.3 cases per 100,000 from 2.5 cases.

Another recent study made headlines in March, when *The New England Journal of Medicine* published the results of a National Institute for Occupational Safety and Health (NIOSH) epidemiological study comparing pregnant telephone operators who used computers with pregnant telephone operators who used lightemitting diode or neon-glow tube displays. The study found no relationship between miscarriages and the number of hours worked at a computer terminal.

Many have interpreted these results to mean that low-level electromagnetic fields have no adverse reproductive effects, but critics of that interpretation point out that the abdomens of the women in the control group and of the women using the computer terminals were exposed to about the same level of extremely-lowfrequency (ELF) magnetic fields. I asked Dr. Teresa Schnorr, who led the research team, about the ELF-field aspect at an April meeting of the Electromagnetic Energy Policy Alliance (EEPA) in Alexandria, Virignia. She told me her study was designed to look at whether computer-terminal technology itself-not ELF electromagnetic fields-had any adverse effect on pregnancies. The NIOSH study was not an "ELF pregnancy study," said

SERVICE HERO

dward Berland of Santa Rosa, California, writes that when he had problems with his Microtek 300Z scanner, the company "made every effort to correct those problems over the telephone," walking him through diagnostics. When that failed, Berland returned the scanner for repair, twice. When it became apparent the scanner was still faulty, Microtek sent Berland a new scanner at no charge-even though the unit was out of warranty. Berland writes that he remains loyal to Microtek because the company "made a bad experience into a good one."

Dr. Schnorr, who suggested that researchers concerned about ELF exposures might want to look at other populations. At least one such study is under way.

Differing Views

Not everyone agrees that more research into the potential health effects of electromagnetic fields is good or necessary. In a paper published this year in Physical Review A, Yale physicist Dr. Robert Adair is blunt: "There are very good reasons to believe that weak ELF fields can have no significant biological effect at the cell leveland no strong reason to believe otherwise." Adair and others argue that the electromagnetic fields emitted by personal computers, power lines, and other devices are so much weaker than electric and magnetic fields created in the body itself that significant health effects are impossible.

The Food and Drug Administration (FDA), which is responsible for regulating devices that generate both ionizing and nonionizing radiation, such as ELF fields, responds mildly by pointing out that "there's no real agreement within the physical science community."

"Others in physics say you are ignoring the fact that the biological system may be able to receive this (continues)

How to Master 20 Popular Macintosh Programs Without Ever Reading The Manuals

Macintosh Programs Can Be Learned in a Few Hours With the Right Training

Over the past four years I've been associated with over 50,000 people attempting to learn the Macintosh computer. I've watched as each person wages their own personal, private battle to master the computer and the most popular Macintosh programs.

I've seen their frustration, have empathized with their confusion, and understood their computer fears. I've talked to workers who have had new computers and new programs simply dropped on their desk with the directive to, "learn this." I've listened to people who have struggled night after night trying to read and understand a computer manual. Can you imagine trying to understand and master 4th Dimension from the manual?

You would be surprised at the number of people who have confided with me the fact that they've given up trying to learn some of the programs. They put the box on the shelf and write the expenditure off as a bad investment.

Hard Earned Money Wasted

Can you imagine how much money has been wasted on programs and computers that are sitting abandoned? Right now think of the people working on Macs in your office. Do they really understand the computer? Do they know what to do when it goes down? How many programs are each of your people using? Have they really mastered the programs they're using? Do they know the short-cuts and valuable techniques that will save you time, money, and increase your professionalism?

An Excellent, Low Cost Training Answer

Four years ago I founded MacAcademy. My purpose was to create a training organization that provided training similar in nature to the Macintosh itself - simple, easy to use, and effective.

Now, four years later the concept has proven to be a great success. Right now people are benefiting from MacAcademy training in over 100 cities in the U.S., in Canada, Great Britain, Australia, Japan, Hong Kong, and 22 additional countries throughout the world.

MacAcademy training is successful for one reason - it works!



The Video Answer

Two years ago we introduced the MacA-cademy Video Training Library. This library now includes over 45 different titles. Each video is 2 hours long and offers clear, concise, effective training for the Macintosh and over 20 popular programs. In many cases you can purchase up to 6 hours of training for one program.

MacAcademy has resisted the temptation to follow competitive training programs who have recently implemented large price increases. Our videos started out at \$49 each and are still only \$49. The best training in the business for less than \$50. This low cost training alternative has proven to be the Macintosh training choice of over 10,000 companies.

Guaranteed Results

The MacAcademy reputation is excellent. Our guarantee is simple: If you're not happy we'll give your money back. No hassles or problems.

To Order

Here is a current list of MacAcademy Video training tapes now available. To order, simply send check, credit card information, or purchase order to MacAcademy Videos Dept. MW1091 477 S. Nova Rd. Ormond Beach, FL 32174 or call the numbers listed below. Now is the time to start training. Thank you for allowing MacAcademy to help you in that effort.

To Order: Call Toll Free 1-800-527-1914

FAX Orders Call 1-904-677-6717 48 Hr. Delivery

Circle 106 on reader service card

The Macintosh Part 1	
The Macintosh Part 2	
The Macintosh Part 3	
Macintosh Networks	
Utilities, CDEV's, Inits	
Using System 7	
HyperCard Basics Part 1	
HyperCard HyperTalk Part 2	T
HyperCard HyperTalk Part 3	
Adobe Illustrator 3.0 Part 1	Ħ
Adobe Illustrator 3.0 Part 1	
Adobe Illustrator 3.0 Part 2	=
Adobe Illustrator 3.0 Part 3	=
Freehand 3.0 Part 1	-
Freehand 3.0 Part 2	-
Freehand 3.0 Part 3	-
MacDraw Pro Part 1	=
MacDraw Pro Part 2	-
Canvas 3.0 Part 1	4
Canvas 3.0 Part 2	_
Canvas 3.0 Part 3	_
SuperPaint Part 1	
SuperPaint Part 2	_
Paints & Draws	
PowerPoint	
Persuasion Part 1	
Persuasion Part 2	
Design & Layout Techniques	
PageMaker 4.0 Part 1	
PageMaker 4.0 Part 2	
PageMaker 4.0 Part 2 PageMaker 4.0 Part 3	
QuarkXPress 3.1 Part 1	
QuarkXPress 3.1 Part 2	
OuarkXPress 3.1 Part 3	
Excel 3.0 Part 1	
Excel 3.0 Part 2	
Excel 3.0 Part 3	
Excel 3.0 Part 4	╗
WingZ Part 1	
WingZ Part 2	
WingZ Part 3	
Works Integration 1	ī
Works Word Processing 2	
Works Database 3	
Works Spreadsheet 4	
FileMaker Pro Part 1	
FileMaker Pro Part 1	
FileMaker Pro Part 3	
Word 4.0 Part 1 Word 4.0 Part 2	
Word 4.0 Part 2	

©1991 Florida Marketing International, Inc.

energy as an informational signal," said Dr. Mays Swicord, chief of the radiation biology branch of the division of life sciences of the FDA. "What is being put in is not random energy but 60Hz sine waves; therefore, the cell is not saying 'I am seeing a bunch of random energy,' but 'I see a specific signal and I am receiving that."

Swicord feels "very certain there

are biological effects from ELF fields; the question that remains in my mind is at what level, at what threshold are the effects triggered." (It's a critical question. Some argue that electromagnetic fields may not follow the traditional pattern that greater exposure means greater harm at all. One possibility is that exposure to high-intensity fields may

be less harmful than exposure to some lower intensity that is frequently interrupted.)

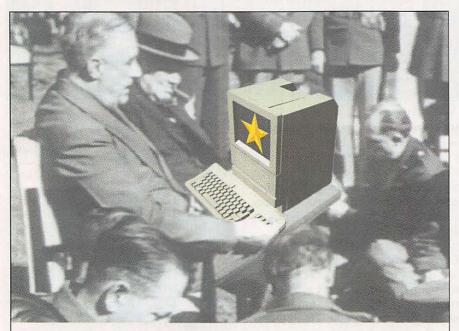
In any case, there's a considerable difference between demonstrating that ELF fields affect cells and that cell changes actually lead to adverse health effects such as cancer. Scientists agree that if there is any adverse health risk from electromagnetic fields, it is small. But even a very small risk to individuals may affect a large number of people because electromagnetic fields are a ubiquitous part of modern life.

So despite the critics, several hundred scientists in the United States are exploring how electromagnetic fields may affect cells and perhaps promote cancer. The FDA, for example, is "looking at two in vitro systems—one looking at gene expression and one looking at calcium-efflux changes," according to Dr. F. Alan Andersen, acting director of the FDA's Center for Science and Technology. The FDA will be involved in a replication of the so-called Project Henhouse study, examining the effect of magnetic fields on chick embryos. The replication of the earlier study should be welcome to many because biological experiments thus far lack the "reproducibility, replication, and robustness" that physicists rightfully demand, according to Dr. Swicord.

National Research Agenda Needed

Officials at NIOSH held a meeting in January to help establish a national research agenda, concentrating on workplace exposure. Epidemiologists at the workshop in Cincinnati agreed that female breast cancer, leukemia, brain tumors, and lymphoma were important areas for future research involving electromagnetic fields. Female breast cancer was added in the wake of a third report showing an excess of male breast cancer among workers exposed to electromagnetic fields, according to VDT News. Several industry groups, including the EEPA and a group of electric-utility companies, are pushing for their own versions of a national research agenda.

Late last year Apple Computer asked the National Academy of Sciences for a nationally coordinated (continues)



"The only thing we have to fear is..."

Is what? How about a boring presentation. The excessive perspiration, the public ridicule, losing your audience, or an important sale. There's nothing quite like it. If you're sitting through one, you feel awful. If you're giving one, you feel worse.

That's why we invented Magic. With Magic, dull becomes dynamic. Tedious becomes

Magic is a better way of presenting. With Magic it is easy to animate text and graphics, add sound, and use responsive buttons to bring you to any point in your presentation. Now you can add pizzazz to static presentations that you may have already created. Or create new ones from scratch.

Is it really that easy? Yes. Gone are the days of complex procedures obscure scripting languages. With Magic you can get immediate results with point-and-click VAMILIAN N

simplicity.

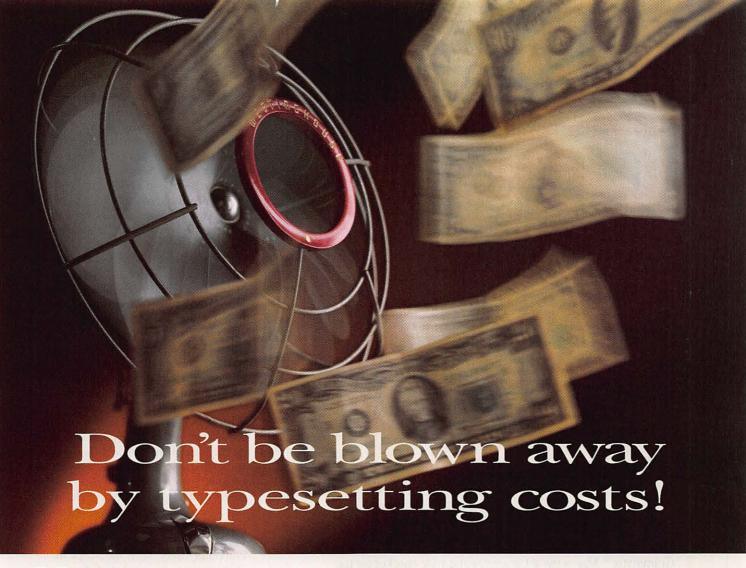
And with the included templates, sounds, backgrounds and buttons, you can get even faster results. Throw together a sales presentation, complete with bullet charts, laughter and snazzy backgrounds in minutes, and customize it quickly for your own needs. With Magic it's a snap. And just imagine the

Now there is an easy way to create presentations, reports, kiosks, training materials, storyboards, and the like, with all of the punch of multimedia. Let Magic unlock the presentation power of your Macintosh and put it in your hands.

It's not just what you say, it's how you say it.

For more information on Paracomp's animation and 3D product line, call 1-800-877-7749





Until now, you've probably been paying big bucks for your typesetting service...while you sweat out your deadlines waiting for your copy to be returned.

LaserMaster has another answer: two personal typesetters that make all your publishing jobs a breeze and take the heat out of your production budgets. With the LaserMaster 1200 or 1000 Personal Typesetters, you can keep more money in your pockets and still have it all:

Plain-paper type that's clear and crisp. LaserMaster's patented TurboRes® technology gives you 1200 or 1000 dpi resolution for crisp type, "jaggie-free" line art, and gorgeous halftones.

Plain-paper simplicity—and affordability. Say good-bye to messy chemicals and expensive photo paper. Your LaserMaster personal typesetter uses only plain paper and replaceable toner cartridges. Even your oversize jobs can be typeset for just pennies a page with the LaserMaster 1200's 11 x 17-inch paper-handling.

The ultimate in performance and convenience. You'll get your typesetting fast: up to 8 pages per minute on the LaserMaster 1000 and up to 20 pages per minute on the LaserMaster 1200. You'll get complete PostScript® compatibility. Plus, you'll get between 35 and 135 premium, hinted typefaces, and

you'll be able to use any other Type 1 Truelmage font. And with LaserMaster's superb TurboRes Enhanced networking capabilities, you can supply your entire work group with fast, high-resolution output.

So stop blowing your typesetting budgets out the window. At \$6,995 for the LaserMaster 1000 and \$14,995 for the LaserMaster 1200, there's an affordable way to put a type shop on your desktop today.

Call today to get your free sample. Learn how you can begin saving money and enjoying all the benefits of LaserMaster personal typesetting today!

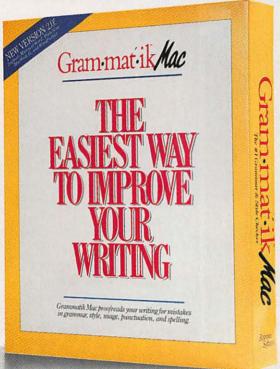
Macintosh information: (612) 944-8726 PC product information: (612) 944-9330



Personal Typesetting: "If You Hate to Wait" M

© 1991 LaserMaster Corporation, 6900 Shady Oak Road, Eden Prairie, MN 55344. The LM logo and TurboRes are registered trademarks, and LaserMaster is a trademark of LaserMaster Corp. Truelmage is a trademark of Microsoft Corp. PostScript and Adobe are registered trademarks of Adobe Systems Incorporated. All other product names or brand names are trademarks or registered trademarks of their respective holders. Specifications subject to change. Yes! All text was produced on a LaserMaster 1000.

Great Grammar,



Guaranteed.

Grammatik™ Mac is the #1 grammar and style checker for the Macintosh.® It's so effective, we guarantee it will make your grammar great, your memos more memorable, and your proposals more professional, or your money back.*

Grammatik Mac proofreads your writing for thousands of errors in grammar, style, usage, punctuation, and spelling. It gives you instant feedback, on-line grammar and style help, and even lets you add your

own writing rules. All of which makes you a better writer, faster. Guaranteed. See your software dealer or call: (800) 872-9933

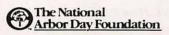
Gram·mat·ik/lac
The #1 Grammar & Style Checker

Reference Reference Software International, 330 Townsend Street, Suite 123, San Francisco, CA 94107. (415) 541-0222. Software - *See your dealer for details. Grammatik is a trademark of Wang Laboratories. © 1991

Turn A New Leaf

F or your free booklet, write:

Tree City USA, The National Arbor Day Foundation, Nebraska City, NE 68410.





study program "which can inform development of design and usage standards for a wide range of exposure conditions." Apple offered to provide financial assistance and other types of support. The academy approved the proposal but added a hook: "The governing board wanted the study to be done without appearance of conflict of interest or bias," said Dr. Charles Edington, director of the Board on Radiation Effects Research of the National Academy of Sciences. "Normally, 50 percent or more of the funds come from govern-ment; 49 percent or less from private funds. This time, no private funds will be accepted." The result has been no study. "We have been unable to obtain funds from the federal government," said Dr. Edington. "We can't move without funding."

What to Do?

In the absence of scientific agreement on the issue, many wonder how to respond to the potential threat of health hazards from low-frequency electromagnetic fields. An Office of Technology Assessment report suggests taking a "prudent avoidance" strategy to minimize any potential risk. For computer users, such measures include sitting at arm's length from a monitor and moving away from the back and sides of coworkers' machines. The EEPA calls prudent avoidance an abandonment of science, but it's an approach several companies, including CBS News and the Boston Globe, are taking.

It will be many years before the question of whether electromagnetic fields are harmful is answered. If you want to help speed the process, lobby government officials to fund needed research. In the meantime, sit back from your computer, but don't become obsessed by it. Stress isn't a healthy response.

(Research assistance by Carolyn Bickford.)

Send nominees for sainthood to Service Heroes, Macworld, 501 Second St., San Francisco, CA 94107, or via AppleLink (Macworld1) or America Online (Branscum). Conversely, drop Conspicuous Consumer a line if a company is ignoring you.

Our new modem will knock your socks off. afford more soci

Introducing the Xeba" 9600 send/receive fax modem/V.42 bis with throughput to 9600 bps

Finally. Xeba brings the aggressive pricing of the DOS market to Macintosh users.

We're Quicktel, a leader in internal and external modems for PCs. But we like Macs. We use them ourselves. And we want Macintosh users to take advantage of this exciting product.

So we've brought our high quality standards, super-efficient manufacturing and Rockwell TrueFAX technology together in this sleek new case.

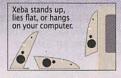
Xeba has send, receive, background operation,

night fax and many more fax capabilities. It's also a V.22 bis/ V.42 bis modem with MNP-5. That means it can achieve throughput up to 9600 bps when connected with a similarly-equipped modem.

It comes complete with DIN-8 cable, power supply and a communications package (Quick Link II) that's menu-driven and mouse and keyboard-friendly.

And you can choose from an elegant black case or Macintosh platinum grey.

Quicktel modems are carefully made in the USA. They carry a lifetime warranty and our 30-day no-questions-



asked money-back guarantee. It's simply the best price/performance deal on the market. And our introductory price is way below that of any comparable modem from our rivals. So act quickly.

Check with your favorite computer store first, and if they don't have it, we'll sell you one direct.

> Either way, you'll save enough to liven up that sock drawer.

Other Quicktel Xeba modems

2400 bps **V.22** bis \$109 2400 bps V.22 bis/V.42 bis w/ MNP-5 \$149 9600 bps Send/Receive Data/Fax \$179 9600 bps V.32/V.42 bis w/ MNP-5 \$449

Introductory price: \$168

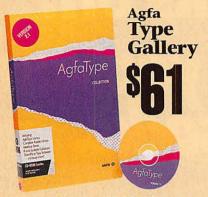
Plus \$6 shipping and handling. Xeba's list price is \$299, so order today. MasterCard or VISA. California residents add 7.25% sales tax.

Call 1-800-735-6442 today

Quicktel modems from Logicode Technology, Inc., 1817 DeHavilland Drive, Newbury Park, CA 91320 (805)499-4443 Fax: (805)499-8588 ©1991 Logicode. Trademarks are property of their respective owners. Dealer/distributor inquiries invited







Agfa Type CD-ROM V2.1 has 20 exclusive Agfa headline faces unlocked plus a Pi and Symbols font of your choice. Over 1650 PostScript fonts (nearly 1000 Adobe typefaces) on a single CD. All you need is a CD drive and the access codes. New fonts are just a call away. #00326

NEW Fonts

Adobe	Systems
03950	Type On Call CD-ROM59
02371	Font 46 Futura 177
03389	Font 142 ITC Century Condensed 239
02334	Font 9 ITC Garamond119
02362	Font 37 Univers239
03235	Adobe Collectors Ed #2 P&T 139
02364	Font 39 Futura Light177
03437	Font 123 Tekton 119
Agfa	
00381	AgfaType w/Toshiba CD-ROM 689
00326	Agfa Type On CD ROM61
Bitstre	am
00396	Font Pack I58
00397	Font Pack II58
04010	Font Pack III98
	Font PackIV 98
Casady	and Greene
00315	Fluent Laser Fonts Libr-special 79
	Science
03559	Design Science Math Type99

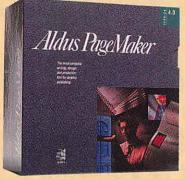


(furnishings to color schemes) and Landscape

Your Choice

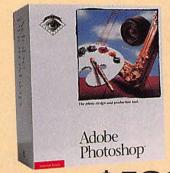
(flowers to fences). All include dozens of

Most Products are System 7 Compatible



PageMaker \$498

PageMaker 4.0 goes beyond the paste-board metaphor that made the original a smash hit. New features include a blindingly fast Story Editor, extended support for color, ability to rotate text, built-in dictionary, checker, plus much more. #03223



Adobe PhotoShop

\$499

PhotoShop 2.0 is the latest version of "Software Product of the Year!" You get direct access to a broad spectrum of color editing and production capabilities. You can easily edit your high-resolution CMYK color scans on screen without converting to monitor RGB. #03139

DESKTOP PUBLISHING

DESKIOT I OBLISHING
Aldus Corp.
03880 Personal Press 1.0 198
03461 Aldus Pre Print328
03223 Aldus PageMaker 4.0498
Delta Point
03984 Taste83
Frame Technology Corp
03582 Frame Maker594
Icom Simulations
03663 Mac Kern58
Individual Software
03758 Individual Trng For Pgmkr 4.0 34
Letraset Graphic Design
01370 ReadySetGo! 4.5164
Quark Inc.
03488 Quark Xpress 3.0518
Spinnaker
00211 Springboard Publisher II108
Timeworks
03798 Publish It Easy 2.0143
Ventura Software - Xerox
03909 Ventura Publisher For Mac 498

TOP DESIGN

	TOT DESIGN	
Adobe	Systems	
03558	Adobe Illustrator 3.0 W/ Atm	348
	Streamline 2.0	
Aldus I	Corp	
03947	Aldus Freehand 3.0	398
	Aldus Gallery Effects	
Broder		
03132	Typestyler 1.5	114
Deneb		
00803	Canvas 3.0	299
Dynaw	are	
03761	Dyna Perspective 2.0	599
Letras	et Graphic Design	
03216	ColorStudio	598
03217	DesignStudio	488
Panton	e Matching Grid	
03435	Pantone Color Book	44
04056	Pantone Color System Guide	44
Strata		
04001	Strativision 3D	348



TABLETS

Kurta	
03012	Cordless 4 Button Cursor 6
03009	8.5X11 Tablet w/Pen & Cur31
03010	12X12 Tablet w/Pen & Cur38
03011	12X17 Tablet w/Pen & Cur 62
Wacon	
03942	4 Button Cursor SD 510C12
03496	SD-510C 6x9 tablet56
	SP-310 Stylus (Soft) 9
	SD-311E 12x18 Elec Stat 132
	12X12 Static Sur 421 E93
03801	SD-422L 12 X 12 Tablet87
	SD-420E83

Keytronics TrakPro \$179

Save time and valuable desk space with the new TrakPro. It includes: fully integrated trackball, seven user-definable Speed Keys, custom Speed Key software, click-lock with LED indicator, auto-acceleration with 200 dpi. Brings the ultimate in flexibility and power to your Mac.

sample plans.

We're Now Open 24 Hours Every Day Call any time to order what you need!



Welcome to the MacZone

Our commitment:

- Hassle-free ordering with no gimmicks and no hidden charges.
- 30 to 60 day money back guarantee on most products.
- \$3 shipping per order for overnight delivery on Airborne Express
- Order as many products as you wish. If any of them fail to meet your expectations then simply call our Customer Service Hotline at 1-800-248-9948 for Return Material Authorization Number.
- Most of our products are System 7
 Compatible. If you have any
 questions about compatibility just
 ask your MacAdvisor when
 ordering.

The MacZone Announces

InfoZone

InfoZone is a new service from the MacZone that offers you product information via your fax machine.

You may receive detailed information on products by simply calling our *InfoZone* fax number and following the computer's voice instructions.

Product information available through *InfoZone* will be denoted by a "Z" next to the product number for each available product. A listing of these products are also offered through the *InfoZone* system.

InfoZone product information can be obtained anytime, day or night, just call

206 • 861 • 6601

NEW Mac Zone Services!

Now! You can place your Mac Zone order through CompuServe...

Tust Call:

Go MZ

Multiple Zones International, Inc.

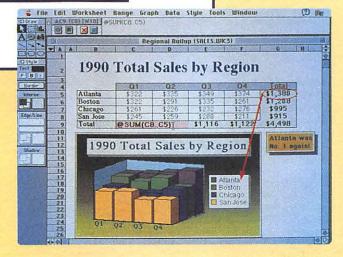
NEW!
Lotus 1-2-3
for Macintosh

123
FOR COMING SOON

Exciting new advance for 1-2-3! Completely redesigned for use on the Macintosh, this new product makes your work incredibly easy!

"It's bound to be an important program..." John Sculley, Chairman & CEO Apple Computer

"...a first rate job of making a powerful product easy to use." Michael Steenberge, Director of Information Services, Corning, Inc.



Lotus 1-2-3 for Macintosh delivers innovative spreadsheet capabilities that provide users simple access to commonly used functions, the ability to customize the desktop to their work styles, and direct manipulation of text,

graphs and objects for intuitive operations. It also provides full file, formatting, macro and keystroke compatibility with all versions of 1-2-3 using the 1-2-3 Classic features, the familiar 1-2-3 menu invoked by hitting the "/" key. It will also fully support Apple's new System 7 operating system.

Product Highlights

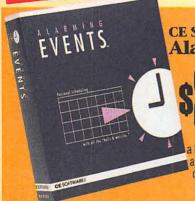
- · Tear-off menus to position anywhere on the desktop
- · Customize your menus for formats, styles and macros
- Console and status bars designed as movable windows
- · Directly manipulate text, graphs and drawn objects
- · Graphs and drawn objects reside on top of the worksheet
- File, formatting and macro compatibility with other 1-2-3
- . The only Mac spreadsheet to offer true 3-D worksheets
- . Query remote databases directly from 1-2-3
- Supports key System 7 features

reserve your copy now!

We'll save you an additional \$10 off our low price.



FREE Shipping with Orders Now You Save Even



CE Software Alarming Events

Your complete personal DA scheduler to keep track of appointments, meetings and special events. Select reminders such as: pop-up menus, flashing icons, even

a barking dog! It keeps an unlimited number of appointment books, prints out, imports and exports calendars and text. #03624

CE Software QuickKeys V2.0

QuickKeys 2 lets you make shortcuts for your Mac. Use keys to automatically back up work, print envelopes, change fonts, select a printer and many other functions. #03771

CE Software QuickMail V2.5

QuickMail is a flexible, extendable LocalTalk-based electronic mail system. It does everything E-mail should do and has gateways to the outside world of MCI Mail, Telex, and dial-up services. #03138

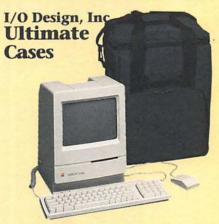


Electronic Arts PGA Tour Golf

Tee off against 60 top PGA Tour pros in real tournaments on actual Tournament Players Club courses. Stunning color or B&W graphics with TV-style coverage. Fast animations and accurate ball play. #00473

	COMPUTER LUGGAGE
I/O Des	signs
	Ult Ext SE: Black, Navy78
	Ult Classic Std: Black, Blue68
	Ult SE: Neon Pink, Yellow, Green 88
	Ult Mac LC w/12" Mon:Blk, Blue 94
	Mac Lug Classic/SE: Black, Blue 64
03794	Mac Luggage SE Ext: Black74
	Mac Lug Ilxc/Cl/SI: Black, Blue 84
03876	Mac Luggage SE 30/Ext: Blue 74
	Mac Lug II/IIfx: Black, Blue98
Lineba	cker/MackPack Bag
01352	Mac/Se Xkb Navy69
00498	Plus/Se Reg. Navy55
02090	Mac/Se Xkb Grey69
00493	Plus/Se Reg. Wine55
Targus	
02546	Mac/Se Reg. Black54
02545	Mac/Se Xkb Black74
02630	Mac/Se Xkb Grey74
02629	Mac/Se Xkb Wine74
00476	Cu/O: Disale 74

03476 Cx/Ci Black74



Put your Mac into an Ultimate carrying case and you can take it anywhere. Great features include high density foam padding, nylon exterior, heavy duty hardware, choice of color, and convenient pockets. See Line Listing for Prices.

ENTERTAINMENT BEST SELLERS

FTL Games
00240 Oids29
Broderbund
03800 Sim Earth Planet Simulator 39
00145 Robosport37
02747 SimCity Color46
02186 Where In The World Is Carmen? 28
02488 Where In The U.S.A. Is Carmen?28
03808 Vette!32
01980 Tetris (B&W And Color)22
01808 Falcon 2.2
02651 Chessmaster 2100 30
Visionary
03112 Synchronicity38
Inline Designs
03934 Tesserae31
03494 Darwin's Dilemma31
Casady And Greene
03462 Sky Shadow28
Centron

02470 Casino Master Deluxe Color 44



Global Village **TelePort** Fax 24/96

TelePort plugs into your ADB connector (like your mouse) eliminating

a power adaptor, freeing your serial ports and enhancing portability. This 2400 baud Hayes compatible modem incorporates MNP5 data compression/error corrections. #00395



Send or receive faxes directly from your Mac and get a 16-level half-tone scanner and 200 dpi printer all in one lightweight, portable package. The New TEFAX is complete with advantages of a dedicated fax and powerful AutoFAX software interface. #00256

Computer Peripherals ViVa Modem MAC

ViVa offers the latest modem technology capable of meeting today's communication standards. With data compression, error control, leased line support and automatic functions, it provides reliable performance

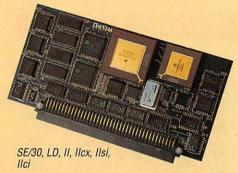


under the most demanding conditions.

24 FX(2400bps w/send Fax) .. \$159 9642E(9600 Fax/Modem)\$479

Placed Between 9pm to 7am E.T. More at the Zone





Daystar Universal Power Cache

The new PowerCache is even faster and fits most Macs, just change the adapter board. Completely universal. Uses the proven 030 processor for 100% compatibility with System 7 and AU/X and others. Get unparalleled performance at 25, 40 or 50 MHz.

Total Systems Gemini 030 20 MHZ with FPU



Gemini transforms your Mac 128, 512, Plus or SE into a Ilci-stomper. Virtual™ is free! Installation is easy. Even use your existing 256K and 1Mb SIMMs. Plugs into SE slot. #03633

ACCELERATOR CARDS

2 200000000	TOR CIL
Applied Engineering Macintosh Ilci	Sigma 00215 Sig
00289 Cache-In (Ilci Cache Card) 194	Total Syst
04071 Cache-In 50 Mhz	Mac Plus , s 00036 Me
04120 Fast Math LC139 Macintosh Ilsi	00034 Me 00048 Me
00831 QuickSilver Ilsi Cache Card 269 Daystar Digital	02902 Ge 03633 Ge
02877 Fast Cache Ilci (64K)278	02903 Ge 03634 Ge
new Fast Cache IIsi (64K)309 Macintosh II	00045 Ge 03635 Ge
03729 SCSI Powercard w/o SIMMS 1199 03730 Ram Powercard w/o SIMMS 749	00047 Ge
Macintosh II, Ilcx, Ilsi	03752 Ge 02899 Ge
Macintosh II, Ilcx, Ilsi, Ilci	Mac SE 00043 Me
new PowerCache 030 40Mhz	00041 Me 00049 Me
new PowerCache 030 50Mhz w/FPU 1979	

Sigma		
00215	Sigma Double-Up Board	.167
Total S	ystems	
Mac Plu	s , 512, 128	
00036	Mercury 030 16Mhz	.499
00034	Mercury 030 16Mhz w/Fpu	.549
00048	Mercury SCSI Module	.199
02902	Gemini 030 20Mhz	.849
03633	Gemini 030 20Mhz W/Fpu	.995
02903	Gemini 030 25Mhz	.995
03634	Gemini 030 25Mhz W/Fpu 1	
	Gemini II 030 33Mhz 1	
03635	Gemini II 030 33Mhz W/Fpu 1	
00047	Gemini II 030 40Mhz 1	
03752	Gemini II 030 40Mhz W/Fpu 1	,899
02899	Gemkit (Us Version)	.125
Mac SE		
00043	Mercury 030 16Mhz	
00041	Mercury 030 16Mhz w/FPU	
00049	Mercury Ram Module	.245
		191

Applied Engineering **QuickSilver**

\$269

QuickSilver gives your IIsi a slot extender, cache card and math-coprocessor. The extender enables cards created for the SE/30 to fit neatly inside the IIse case. It provides quicker screen refresh, scrolling and image manipulation, and greatly increases the speed of mathintensive applications. Five-year warranty. #00833



Mass Micro S1199 DataPak 88

Voted best by industry critics, it's still the first family of removable cartridge drives. 88 Mb on each cartridge adds capacity and backup to your valuable data. Actually faster than many fixed hard drives. Has PadLok utility and DiskDoubler software. #04062

HARD DRIVES

CD Ted	hnologies	
03767	Porta Drive CD-ROM	648
Datace	1	
00405	52 Mb Qlps External	399
	52 Mb Qlps Internal (Classic)	
04693	52 Mb Qlps Internal (NuBus)	299
03683	105 Mb Q External	499
03685	170 Mb Q External	928
new	210 Mb Q External	1049
Everex	Systems	
03831	EMAC 20mb Impact	199
	EMAC 150 Tape Backup Drive .	
02047	EMAC 60T Tape Backup Drive .	649
IDS Liv	ringstone Tech	
00144	20Mb Clipper	369
00037	40 Mb Pro Drive	349
	80 Mb ProDrive	
00170	50Mb Wip Drive	439
00171	100Mb Qlps Wip Drive	649
	45 Mb Syquest Removable	

La Cie Limited

Lu oic	Liiiitou	
	Tsunami 52 Mb Hd Qlps 699	
03949	Tsunami 105 Mb Q Lps929	
03699	Tsunami 170 Mb Hd Q1,225	
03700	Tsunami 210 Mb Hd Q1,325	
03701	La Cie Silverlining V 5.28149	
MacLe	gend	
00921	45 Mb Removable539	
Mass I	Microsystems	
00175	DataPak 45 Mb Removable 689	
00176	DataPak CX 45Mb Removable 749	
PLI		
	105 Mb Q External699	
03269	Turbo 250 Mb External 1699	
03281	Turbo 600 Mb External2,595	
00442		
02182		
	Infinity 88 Turbo Removable 1,299	
02851	Infinity Optical 600 Mb3,794	
03691	CD-Rom Drive699	
Rodime		
03807	45 Mb Syquest Removable549	

\$699



Infinity 40 Removable

Uses PLI's supercharged driver software to attain 20ms access time! Gives you infinite storage potential with removable cartridges. Each holds 44Mb. #02181

PLI Quick SCSI A simple, powerful way to solve SCSI port bottleneck. Lets your hard drive work at maximum speed.

#00811





Welcome to the If you have one computer

MAC - PC CONNECTIVITY

On Technology Instant Update V1.02

Instant management, instant productivity, instant changes: you get it all with Instant Update, It's the software that helps you create documents you need to develop in a group setting where everyone can contribute their expertise in an on-going process. #04048



Datav		П
	Maclink Plus Pc 5.0 W/ Cable 13	28
	Maclink Translators	
Dayna (Communications Inc	
03891	Dayna Dos Mounter 2.0	53
02609	Daynafile 360K 5.25" Drive 4	45
	Daynafile 1.44Mg 3.5" Drive 5	
	Daynafile li 1.44 Mb Hd 5.25 4	
	Daynafile li 360K Ld 5.25 4	
02615	Daynafile Dual 360K/1.44Mg Dri . 6	49
02616	Daynafile Dual 1.2Mg/1.44Mg Dr 8	04
	Daynafile Dual 360K/1.2Mg Driv . 6	49
Daysta	r Digita	
	LT200 MC Localtalk Board2	
02214	LT 200 PC Localtalk Board 1	85
FGM, II	nc.	
00809	Picture This	64
Insigna	Solutions	
03193	Soft Pc - Portable2	44
	Access Pc	
-		

03982 Soft	t PC Classic	125
03282 Sof	t PC Ega/At (Need 2	506) 124
02506 Sof	t PC 1.3	241
Orange Mil	cro	
00000 xxx	x	000
Sitka/Tops		
01677 Top	s Flashcard (Dos)	195
03364 Top	s 3.0 Network Dos	3.5" 149
03363 Top	s 3.0 Network Dos	5.25" 149
Traveling S		
03975 Lap	link Mac III 3.2	92
	icher, Quinn	
00262 Ref	lection 3 +	360



Argosy Run PC

Connect your Mac to an IBM PC compatible and run virtually any DOS program full speed in a Mac window while controlling it with the Mac. Includes Software Bridge/Mac for document translation.

CALL FOR OUR FREE CATALOGUE 1.800.248.0800

· Major credit cards accepted. No surcharge.

- Your credit card is not charged until your order is shipped. If we must ship a partial order, freight is not charged on the back order.
- Most personal and company checks that are received with order will clear immediately. All checks or purchase orders must have a phone number in order to be processed.
- COD orders are accepted: Limit \$1,000 per order. Cashiers check or money order only. Add \$5 per order
- Educational, government and corporate purchase orders are accepted.
- All U.S. shipments insured at no extra charge
- No sales tax except for WA residents (add 8.2%).
 Prices and product availability subject to change without notice. We are committed to offering low prices and product availability. Call for our most current prices. All products covered by 120 day limited warranty. Shipping \$3 per order. We ship Airborne Express overnight
- service. (Some rural areas require an extra day). (Monitors: 2page \$50 overnight, \$25 UPS Ground; 1-page \$25 overnight, \$15 UPS Ground.)
- Orders placed by 9 pm ET (6pm PT) weekdays for 'in stock" items will ship that day for overnight delivery (barring system
- APO/FPO/PO box orders shipped 1st class U.S. mail.
- Defective software will be replaced immediately, and hardware will be replaced or repaired at our discretion.
- Most products carry a 30-60 day money-back guarantee. Call 1-800-248-9948 for return authorization number. Weekdays: 7am-6pm PT, 10am-9pm ET.

MacZone 18005 NE 68th St., Suite A110 Redmond, WA 98052 Outside USA: 206+883+3088 Canada: 800+248+0344 FAX: 206+881+3421

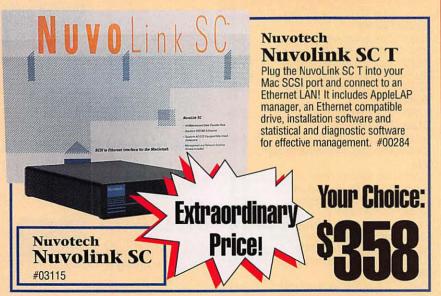


Microtek

TrueLaser Printer

Tomorrow's printer-today, TrueLaser is the first laser printer that's fully PostScript, Truelmage, and PCL compatible. It's also the first to come bundled with 35 resident TrueType fonts. You get faster printing and even auto-switching between interfaces. Six month on-site service. #04047

\$1699



LAN Zone of Connectivity or ten, we have your solutions



Farallon
Timbuktu 4.0

Timbuktu is a versatile network application that allows you to observe or control another Macintosh over any AppleTalk network. It provides clipboard exchange and full background file transfer. This new version of the Eddy Awardwinning software now supports color. #00420



Farallon
Star Controller
PN-507

Established 1986

\$1399

The StarController EN repeats Ethernet signals over 12 ports and monitors network traffic and error rates. It supports a variety of Ethernet devices from PCs to VAX minicomputers. It continuously checks the connection to each device, shutting off unused ports to prevent disruptive

signal error. #03333

#00829 PhoneNET StarController Series 300\$799

201

LAN Accessories

ETHERNET CARDS, MODEMS, CONTROLLERS

Asante	
03648 Mac Con SE E	269
Macintosh IIsi & SE/30 Thick/Thin	
03647 Mac Con + 30iE 64	
00020 Mac Con+ 30iE	
04031 MC + 30iE/Radius	
00228 Mac Con + 30iE 64K Ram	
00820 Mac Con + 30iE MC 64k Ram	399
Macintosh IIsi & SE /30 Thick/10 Base T	
00228 Mac Con + 30i ET 64	
03646 Mac Con+ 30i Et	
04030 MC + 30iET/Radius	269
Macintosh II Family	004
03642 Maccon + II ET 64	304
03641 Maccon + II E	269
	070
00324 Mac Con + LC MC	
00029 Mac Con+ LC E&T	209
00325 FNLC 10T 10 Base T External Products	209
03885 10 Base T Hub	600
03945 10T Mau	
	33
Cayman Systems 00181 Gator Box CS	1055
Gator Box CS -T	1995
03117 Gator Card E/II (IISeries)	299
Gator Card E/Si MC	447
Dayna Communications Inc	
03547 DaynaPort E/SE	264
00805 DaynaPort Ilsi	264
03549 DaynaPort E/30	264
03548 DaynaPort E/II	264

00806	DaynaPort E/LG	264
00805	DaynaPort E/Z	264
00003	Dayna Port E/Z Dayna Ether Print 20 Baset	348
03546	Dayna EtherPrint/Local Talk	348
Dove C	Computer Corn	
02530	Computer Corp Ethernet Fastnet SE	340
02531	Ethernet Fastnet SE/30	340
02532	Ethernet Fastnet III	
Farallo	п	
03333	Star Controller PN 507	1399
00829	Star Controller 300 Series	799
03902	Farallon Ethernet Mac II Card .	299
03901	Farallon Ethernet SE/30 Card .	299
Nuvote	ch	
02184	Turbo Bridge	318
03121	Turbo Star	815
03119	Nuvolink II	
00284	Nuvolink Sc-T	369
03115	Nuvolink Sc	
Shiva		
01406	Shiva Netserial	274
02701	Etherport SE	350
02702	Etherport SE/30	350
02542	Shiva Telebridge	408
02700	Etherport II	350
02985	Ethergate	1295
01615	Shiva Netmodem V2400	
03251	Shiva Netmodem V.32 9600	1165
200 garage 200 to 200 c	Shiva Netmodem/E	
02685	Fast Path IV	1885
04038	Fast Path V (thick/thin)	1899
	Fast Path V (10 base T)	1899

Dayna Communications, Inc.



NetModem \$330 V2400

This 2400-baud modem can be shared by Macs and PCs on the AppleTalk network. It plugs in anywhere along the network and needs only a single phone line. It also has Dial-in support so you can use the AppleTalk network from a remote location. #01615



Texas Instruments MicroLaser PS 17

MicroLaser PS 17 is the solution for the entrylevel desktop publisher. It combines features of the standard MicroLaser plus Adobe PostScript language with 17 built-in, scalable PS fonts. The MicroLaser control panel makes the printer extremely user-friendly. #04096



Our back to school advice

Use it each day to make a Grade A

FOREIGN LANGUAGE

Hyperg	lot	
03749	Japanese Kanjimaster	98
03737	Spanish Word Torture	34
03750	Japanese Easy Kana	128
03741	French Word Torture	34
03745	German Word Torture	34
03740	Spanish Pronunciatio	
03739	Spanish Tense Tutor	41
03738	Spanish Verb Tutor	38
03742	French Pronunciation	34
03893	Learn Spanish CD Rom	60
03892	Learn French CD Rom	60
03743	French Verb Tutor	38
03744	French Tense Tutor	41
03747	German Verb Tutor	38
03732	Russian Word Torture	34
03733	Intro To Russian	
03746	German Pronunciation	34
03735	Russian Noun Tutor	58
03748	Italian Word Torture	34
03734	Russian Verbal Aspect	41

STRUCK

FRENCH

IGNDOS!



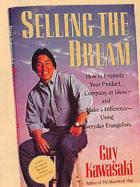
Microsoft Word 4.0

The word processing program that has a range of features to keep pace with the most demanding professional, yet easy for novices to use. New: WYSIWYG editing display, enhanced table support, more page layout features, enhanced

customizability. #02238

Harper Collins Selling the Dream

Guy Kawasaki's latest book presents a new approach to selling: how to turn your customers to converts. It includes the original Macintosh Product Introduction Plan and how it served as the foundation of one of the century's greatest marketing successes: the Macintosh personal computer. #04068



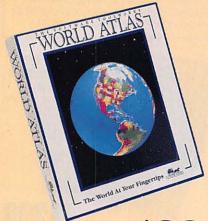
Hyperglot French Survival Manual

An electronic

phrase book divided into topics of interest to

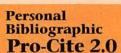
travellers. Each con-

tains about 25 recorded phrases by native speakers plus other study guides. With a MacRecorder, you can record your own voice and then compare pronunciation. Also German and Spanish versions.



Electronic Arts World Atlas

Bring the globe to your computer screen. Includes world atlas, almanac and world fact book with instant access to over 240 EGA/VGA color maps and database of international information. #03589



Pro-Cite is a powerful database enabling you to manage

and format bibliographic and text information automatically. Latest version offers new features including instant searching. expanded word processing and increased record capacity. #01892

Pro-Search

Pro-Search is a specialized front-end software program that simplifies searching of DIALOG databases. It's unique, menudriven interface helps you select the most useful database to search.



Biblio-Links

Biblio-Links are companion programs to Pro-Cite. Each transfers records downloaded from online services, CD-ROM and disk-based data directly to Pro-Cite. You can merge with existing databases or store in a Pro-



Symantec **Great Works**

New Great Works offers eight feature-rich applications in a single, easy-to-use integrated program. Get full word processing, database, spreadsheet, charting, drawing, painting, outlining and communications modules. Includes a 100,000 word spell checker and 660,000 word thesaurus. .#04032

TopWriting Tools A Lasting Impression

03103	Resume Expert	47
03243	Resume Xprt - Cover Letters	47
Caere		
00120	Omnidraft-Mac	79
02158	Omnipage 2.1	494
00418	Omniproof	104
00419	Omnispell	68
03659	The Typist	478
Claris		
02485	Macwrite li V1.1	138
Micros	oft Corporation	
02238	Microsoft Word 4.0	244
	ystems, Inc	
	ReadRight For Macintosh	329
Parago	n Courseware	
03479	Nisus 3.05	244
01473	Qued-M	85
	erfect Corporation	
00057	Wordperfect 2.01 Upgrade	99
03972	Wordperfect 2.01	278

#11002

will Energize your Mac with these Great Products from the Zone



Mass Micro Sytstems QuickImage 24 Video Frame Grabber

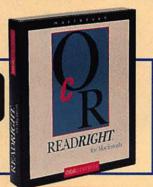
Super

The QuickImage 24 Video Frame Grabber captures 24 bit color or 8 bit gray scale images from full motion

video. It fits in a single NuBus slot and does auto switchintg between NTSC and PAL signals. A PhotoShop plug-in allows users to capture images directly into Adobe Photoshop. Now with PhotoShop Limited, while supplies last. #00180

OCR Systems ReadRight MAC

With ReadRight and a full-page scanner you can easily and efficiently convert paper documents into editable computer text files. Recognizing with 99.9% accuracy, it automatically separates text from graphics and outputs text directly to software programs. #00461



SCANNERS

02916	Scanner 300/GS (8 Bit - 1,495
Animas 00149	True Color Hand Scanner 575
Dest 03929	Dest Scanner W/Recognize OCR . 685
Logited 02561 Microte	Scanman 32w/Digital Darkrm 298
04047	True Laser Printer
03231	Half-Page Scanner294
Thunde	Full-Page Scanner
	Thunderscan Plus198 Thunderware Lightning Scan 400 384
	Lightning Compact279

Monitors

Established 1986

E-Machines - Color Systems for Mac II
03919 T16 8-Bit1995
00205 T-19 24-Bit3999
02414 TX-16 24 Bit3695
03920 T16/XL242999
03921 TX16 8-bit IIsi2699
04105 Colorpage E-161149
Megagraphics Macintosh LC/II/SE30/SE
Rival 19 Mono Monitor1,199
Microtek
04122 14" Color (1280 X1024)569
Sigma
03859 Silverview MacII1850
Macintosh LC/II/SE30/SE
Pageview Monitor 850
MultiMode1399



1800 Now Open (

Caere The Typist Typist, personal scanner

for the Mac, gives you all the power of a small typing pool right at your desk. Scan rows of

numbers directly into your spreadsheet, or columns of text to your word processor. It handles virtually any font or font size. #03659

and Digital Darkroom Logitech and Silicon

Logitech Scanman 32

An extra-value offer from

Beach/Aldus: buy ScanMan Model 32 and get

Digital Darkroom (list \$499) absolutely FREE! ScanMan offers easy scanning and excellent results. With its software you can scan directly into Digital Darkroom which offers a wide choice of filters, printing options and even colorization.

Kensington **Turbo Mouse V.3.0** Winner of the '87, '88 and '89 Macworld' World Class Awards for Best Input Device. Turbo Mouse is quicker, more precise and easier to use than any other mouse. You move only the ball, not the whole mouse. #01411 **Other Great**

Kensington Products

LaserStand Holds and organizes all laser printer accessories, raises

printers to more convenient height, manages your cables, and has special storage areas. #09523

PassProof Offers total defense

against unauthorized use of your Mac. It works with a simple series of hardware and software locks that you can control.



MICE TRACKBALLS JOYSTICKS

Abaton Technology Corp 01507 Pro Point ADB (SE & II)	79
Altra 02935 Felix	
Datadesk 03780 Switchboard Switch Track	Ball 97
Kensington 01292 Trackball	107
Microspeed 03306 Mactrac Trackball 512/Plu 03305 Mactrac Trackball ADB	
Micro Touch Systems 03412 Unmouse	159
Mouse Systems Technologies 03629 Little Mouse A+ (512/Plus 03630 Little Mouse For ADB	
Advanced Gravis 02740 Mousestick Joystick 512	& Plus 64
Kraft 00941 Joystick Quickstick 512 & 01990 Joystick (Premium III) AD	Plus 39



Big Deal.

MAC PLEPC

MAC PLUE TRANSLATORS

When Apple and IBM start talking it makes front page news. But savvy Macintosh owners know that Macs and PCs have been on speaking terms for years, thanks to DataViz's MacLinkPlus.

Since 1984, our award winning MacLinkPlus has been providing file transfer and translation solutions for Macintosh and PC owners everywhere. With its vast library of over 350 translators, MacLinkPlus keeps the lines of communication open between all popular word processing,

spreadsheet, graphics and database programs.

Our latest version includes over 50 new translators for the hottest new software around, including Word for Windows, Windows graphics, Multimate 4.0 and WordPerfect for the Mac. We've even included DOS Mounter software from Dayna, so you can access DOS disks with your SuperDrive

both on the Macintosh desktop and within all Mac applications.

If your Mac and PC are already connected, then all you need is MacLinkPlus/Translators, a full library of Mac-PC translators and DOS Mounter software. If you need to connect your Macintosh and PC, MacLinkPlus/PC includes a serial cable and modem communications software in addition to the translators and DOS Mounter.

So don't just speculate on the future of better communications between Apple and IBM. Call DataViz at (800) 733-0030 or

(203) 268-0030 for technical support.

Look Who's Talking Now!



DATA

UPDATES

This section lists the latest versions of selected Mac applications that were announced by the time we went to press. To have products considered for this section, send a press release to Updates, Macworld, 501 Second St., San Francisco, CA 94107, or fax it to 415/442-0766.

PRODUCT	V.	REQ.	*	s
4TH	2.1.1	1MB/6.0		FREE
DIMENSION	4			
AATRIX	3.02	512K/4.1		*
CHECKWRITER II				
AATRIX	2.0	512K/4.2		FREE
TIMECARD				
ACCOUNTANT, INC.	2.1	1MB/6.0.3		•
PROFESSIONAL				
ACCUTEXT	2.0	4MB/6.0.2		٠
ADDRESS	2.0	1MB/6.0.2	100	\$25
BOOK PLUS	1			
ADOBE	3.0	2MB/6.0.3	2/91	
ILLUSTRATOR	100			
ADOBE	2.0	2MB/6.0.2	9/91	\$199
PHOTOSHOP				
ADOBE	2.0	1MB/6.0.2		FREE
TYPE MANAGER				
AFTER DARK	2.0	512KE/4.1	5/91	
AGFATYPE	2.0	2MB/6.0.2		FREE
ALDUS	3.0	1MB/6.0.3	8/91	
FREEHAND				
ALDUS	4.0.1	1MB/4.1		FREE
PAGEMAKER .	2			
ALDUS	2.0	1MB/6.05		*
PERSUASION				
ALDUS	2.1	1MB/6.0.5		*
SUPER 3D	8 ,			
ANTITOXIN	1.4	512K/3.2	-	\$15
APPLESHARE		512K/3.2		
FILE SERVER				
APPMAKER	1.2	1MB/6.0.5		*
THE ART	2.0	1MB/6.0	10	\$20
IMPORTER		1111-1414		
ARTROOM	5.0	512K/3.2		
ASHLAR	2.0	4MB/6.0.2		\$95
VELLUM				750
ATONCE	1.2	1MB/6.0.5		
A/UX	2.0	4MB/6.0.5		
BACKFAX	1.5.1	100000000000000000000000000000000000000		\$25
BACKMATIC		1MB/4.2		•
BILL-IT	2.6	1MB/6.0.3		•
BITSTREAM	2.0	1MB/6.0	17	
TYPEFACE	2.0	11110/010		
LIBRARY				

PRODUCT	v.	REQ.	*	s
BUSINESS	1.4.1	1MB/6.0		
SENSE				
BUSINESS	3.2	512K/3.2		FREE
SESSION	83.53			
CA-CRICKET	2.0.1	1MB/6.0		
PRESENTS				
CANOPENER	1.1	512K/3.0		FREE
CANVAS	2.1	1MB/6.0		
CAPTURE	4.0	1MB/6.0	Y I	\$30
CARBON	2.0	1MB/6.0.5	100	
COPY MAC				
CLARIS	2.0.2	2MB/6.0	en i	\$79
CAD				
CMS UTILITIES	7.0	2MB/7LD		\$25
COLOR	2.07	1MB/6.0.5	11/90	\$15
MACCHEESE	100000			
COLORSTUDIO	1.5	4MB/6.0.5		*
COMPUSERVE	1.03	1M8/4,1	12/90	*
INFORMATION MANAGER				
COMPUSERVE	3.0.4	512K/4.1	12/90	
NAVIGATOR	2.00			
CONCERTWARE	5.1	512KE/4.2		\$35
CORRECT	2.0	1MB/4.2	1	
GRAMMAR				
DATAMERGE	2.0.3	512K/3.2	IN	FREE
DATAPRISM	1,1	1MB/6.0		FREE
DELTAGRAPH	2.0	2MB/6.0.5		\$50
DELTAGRAPH		2MB/6.0.5	mile	\$75
PRO				
DELUXEMUSIC	2.5	512K/6.0.2		
CONSTRUCTION SET				
D.E.S. DOCUMENT	4.1	1MB/6.0		
EXCHANGE SYSTEM				
DESIGNCAD	3.0	2MB/6.0.5		•
DESIGNSTUDIO	2.0	1MB/6.0		*
DESKPAINT	3.03	1MB/4.2		FREE
DEVELOPER	3.0	1MB/6.0		\$15
STACK				
DIGITAL	2.0	1MB/6.0	9/91	*
DARKROOM				
DISKDOUBLER	3.7	1M8/6.0.2	12/90	\$15
DISKEXPRESS II	2.07	1MB/6.0	11/90	
DISKFIT AND	2.0	1MB/6.0	7/91	٠
NETWORK DISKFIT	7.5			

PRODUCT	V.	REQ.	*	S
DISKTOP	4.01	1MB/6.0		
DISPLAY	1.1	1MB/6.0.3	m	
ADBUILDER				
DOLLARS &	5.0	512KE/3.2	V.	1.6
SENSE				
DOUBLE HELIX	3.5	1MB/6.0	71.5	\$99
DREAMS	1.1	1MB/6.0.2		
DYNAPERSPECTIVE	2.04	2MB/6.0.4		FREE
DYNODEX	2.0	1MB/6.0		\$25
EARTHQUEST	2.0	1MB/6.0	4/91	(*:
EASY COLOR	2.0	1MB/6.0.2		
PAINT				
EMPOWER II	4.01	1MB/4.2		
FAMILY	2.7.3	512K/4.2		٠
HERITAGE FILE				
FASTBACK II	2.1	512KE/4.1		\$30
FAST	2.0	1MB/6.0	11/90	\$25
FORMS				
FASTLABEL	2.02	1MB/6.0		
FASTTRACK	1.5	512KE/5.5		\$20
FAXGATE	1.12	1MB/6.0		FREE
FILEMAKER	1.02	1MB/4.2	2/91	FREE
PRO				
FILEVISION V	1.1	1MB/6.0.2		*
FILMMAKER	2.5	5MB/6.0.3	3/91	•
FINALE	2.6	1MB/6.0.2		FREE
FINDSWELL	2.01	512KE/3.2		*
FONTOGRAPHER	3.2	1MB/4.2		
FONTSHARE	2.2	1MB/6.0		FREE
FONTSTUDIO	2.0	1MB/6.0.5		
FOXBASE+/MAC	2.01	1MB/6.0	14. 1	FREE
FRAMEMAKER	3.0	1MB/6.0	1/91	
FREEDOM	3.0.1	2MB/6.0.3		FREE
OF PRESS				
FREEFLOW	4.0	1MB/6.0.3		
FULL	2.0	1MB/6.0		\$50
IMPACT				
FULLWRITE	1.5	2MB/6.0.2		
PROFESSIONAL				
GENERIC	1.1	1MB/6.0.5		
CADD				
GEOQUERY	2.0	1MB/6.0		
GOFER	2.0	1MB/4.1		\$25

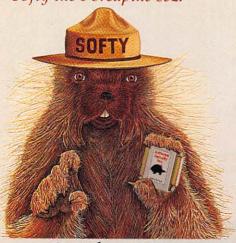
V. = version #. Req. = min. RAM and system software required.

^{★ =} last time (in the past year) this or an earlier version reviewed.

^{\$ =} cost of update to registered owners.

 ⁼ contact your dealer for update policy.

Blue = new version this month. **Yellow** = reviewed product.



Only You Can Prevent Software Piracy

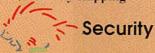
Software Security gives you the tools to do it.

More and more companies are looking for ethical ways to prevent theft of intellectual property. Software Security's Mactivator (hardware key) is just such a method. It prevents illegal execution of Macintosh programs while allowing unlimited back-up capability and unimpeded hard disk and LAN operation.

Each device is uniquely coded and can have an optional 1, 2 or 4 kilobits of on-the-fly programmable memory. You have the right and obligation to protect your intellectual property. Call today and find out how our tools can help you.

- Uses SCSI, but does not require ID number, completely transparent
- Optional 1, 2 or 4 Kbit of on-thefly programmable memory
- Compatible with all Mac environments including Ver. 7.0 beta
- 32-bit clean
- No minimum order
- Made in USA, 7-10 day shipping

Software



1011 High Ridge Rd Stamford, CT 06905

1-800-333-0407

In CT 203-329-8870 FAX 203-329-7428 AppleLink D2379 BBS 203-329-7253

In Europe call (UK) +44 784 430 060

Mactivator, Macintosh and Applet ink trademarks are owned by their

PRODUCT	V.	REQ.	*	s
GRACELAN	2.0	1MB/6.0.5		
GRAMMATIK	2.0	1MB/5.0		\$29
MAC				
GREAT	1.4	1MB/6.0	12/90	
GANTT				
GREAT PLAINS	5.35	1MB/6.0		
ACCOUNTING				
SERIES				
HAND-OFF II	2.2	1MB/6.0.5		\$35
HELP DA	3.1.1	1MB/6.0		FREE
HYBASE	2.0	1MB/6.0		•
HYPERANIMATOR	1.5.2	1MB/6.0.3	T T	•
HYPERCARD	2.1	1MB/6.0.3		\$49
HYPERDA	2.0	512K/3.2		
HYPERWINDOWS	1.2	1MB/6.0.2		\$20
ICON-IT	2.1	1MB/6.0.2		
IF:X FORMS	1.1	STATE OF THE PARTY		FRE
DESIGNER		The state of the s		
IMAGESTUDIO	1.5	1MB/6.0		\$99
INFOLOGIC	1.10			\$5
ENVELOPE	13.2	- 1-25		1
INSIGHT	2.1.1	1MB/6.0		
EXPERT				
ACCOUNTS PAYABLE				
INSIGHT	2.2	1MB/6.0.2		
EXPERT				
ACCOUNTS RECEIVABLE				
INSIGHT	2.2	1MB/4.2		\$99
EXPERT				
GENERAL LEDGER	100			
INSPIRATION	3.0	1MB/4.2	11/90	
INSTANT-EXPERT	2.0	1MB/5.0		FREE
PLUS				
INTERACTIVE	1.2	1MB/6.0.2		\$29.95
PHYSICS				
INTOUCH	1.1	1MB/6.0.5	5/91	FREE
JETLINK	2.1	1MB/6.0	147.50	
EXPRESS	201			
KALEIDAGRAPH	2.1	2MB/6.0.5	9/91	\$20
KIWIENVELOPES		512KE/4.1		
LABVIEW	-		10/91	
LANGUAGE SYSTEMS	_	4MB/6.0.5 2MB/6.0.4	10/01	FREE
FORTRAN		21110,010.4		· met
LAPLINK	3.2	512K/2.0		FREE
MAC III	0.2	STEN E.U		, net
LAPLINK	3.0	512K/2.0		•
MAC PLUS III		37814814		
LASERPAINT	1.02	1MB/6.0.3		FREE
COLOR II	1.02	71110/0.0.3		THE
LETRASTUDIO	1.5	2MB/6.0		\$45
LIGHT CHECKBOOK	2.0	1MB/6.0.3		\$45
ACCOUNTING	2,0	rwb/6.U.3		
LIGHTSPEED	2.5	1MB/6.0.5		
COLOR LAYOUT	2.5	1WID/0.U.5		
SYSTEM	4.1	1MB/6.0		FREE
LXR.TEST MACANALYST	2.0	1MB/6.0		FREE
	2.0			

PRODUCT	v.	REQ.	*	S
MACARCHITRION	5.5	2MB/6.0.3		
MACCLASSADS	4.0	1MB/6.0		*
MACDRAFT	2.1	1MB/6.0.2	12/90	*
MACDRAW II	1.1	1MB/6.0		*
MACENVELOPE	5.0	512KE/3.2		\$25
MACENVELOPE	2.0	512KE/3.2		\$50
PLUS				
MACFLOW	3.5	1MB/6.0.3		•
MACFORTRAN	1.1	2MB/6.0.2		FREE
FOR MPW				
MACGRAPHX	2.0	4MB/6.0.3	4/91	FREE
MACLINKPLUS/PC	5.0	1MB/6.0.2		
MACLINKPLUS/WANG VS	4.0	512KE/3.2		\$45
MACMONEY	3.5	512KE/4.0		\$12
MACPHONEBOOK	3.0	1MB/6.0	9/91	*
MACPROJECT II	2.5	1MB/6.0		\$99
MACRECORDER	2.03	512K/3.2	711	
MACROMIND	2.0	2MB/6.0.2		\$100
DIRECTOR				
MACSAFE II		512KE/4.2	THE	
MACSCHEDULE	2.5	1MB/6.0		\$30
MACTERMINAL	3.0	512K/3.2		\$65
MACTOOLS	1.2	1MB/6.0	1/91	
DELUXE				
MACTOPS .	3.1	1MB/6.0.5		
MACWRITE II	1.1	1MB/6.0		FREE
MACWRITE		1MB/6.0		
PRO				
MANAGING	4.0	1MB/6.0.3	-	
YOUR	2000			
MONEY				
MAPGRAFIX	2.1.1	4MB/6.0.3		
MARCOPOLO	1.1	1MB/6.0		FREE
MARKETMASTER	11+	1MB/6.0.3		\$25
MARKUP	1.03	1MB/6.0		FREE
MASTERFINDER	1.1	1MB/6.0.5	6/91	
MATHCAD	2.06	1MB/6.0.2		FREE
MATHEMATICA	2.0	1MB/6.0		
MATHTYPE	10000	512K/6.0.2		
MATHWRITER	POLICE.	2MB/6.0.5		
MATLAB	100	1MB/3.0	-	
MAXPAGE	1.2	512K/3.2		FREE
MCCPRINT	2.1	512K/4.2		\$25
METAMORPHOSIS	2.10	100000000000000000000000000000000000000		• • •
PROFESSIONAL		1MB/6.0.3		15
and the second s	20	E128/4.2		
MICROPHONE II	3.0	512K/4.2	0/01	
MICROSOFT	3.0	1MB/6.0.2	2/31	
EXCEL	7.0	E128/2 2		
MICROSOFT	2.0	512K/3.2		1
FILE	2.0	1140 00 00	0.00	
MICROSOFT	3.0	1MB/6.0.2	8/91	٠
MAIL	0.00	1140.0	_	-
MICROSOFT	2.01	1MB/6.0		FREE
POWERPOINT				
MICROSOFT	4.0	512KE/3.2		
WORD				

\$125

64 Pages in July Macworld! Zone's creative minds achieve the impossible with Macs





As the computer age continues to gain

momentum, the word "impossible" seems to be losing its strength when you talk about getting something done. That's what we found out when we created these 64 pages with the help of our Macs and some motivated professionals. From the "Let's do it!" from our chief, and the initial concept to the pages you read in July Macworld, we produced this catalog in weeks instead of months.

Pumping out a 64-page full color catalog complete with design, photographs, copy and a tidal wave of planning and coordination in that amount of time is enough to drive anyone completely insane. That is, if you don't have a Macintosh and loads of bright creative people that love to work on them.

Using our talented in-house design team, and our MacAdvisors, we eliminated some of the time wasting, painstaking "old world" procedures by going digital, from start to finish. With

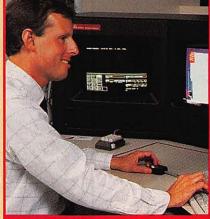
access to technology like Aldus PageMaker 4.0 and Freehand 3.0, Zedcor Desk Draw/ Desk Paint, and Adobe Photoshop mechanials, all those hassles are a thing of the past. We use the software we sell in the production of all our ads. Information on the latest products and hardware from our MacAdvisors has saved many a headache.



THE ZONE DESIGN TEAM: SARAH LIGHTHALL, ROB DERIDER, MARIE WEINAND, CURTIS CRONE, BRENDA TUTTLE, MARIANNE HANSON. NOT PICTURED: LAURIE LASSMAN, Monica Kaul, Deborah Sanders, Marcia Glover.

We at the MacZone believe in the products we sell and our people that help you make your choice. We understand the amazing things you can do with today's Macs and with a little help from our MacAdvisors. We'll continue our endeavor to make the MacZone the retailer to call for all the software and accessories you need.

> Thanks for asking about our catalog, and thanks for ordering your products from the MacZone.



MAGES MERGED ELECTRONICALLY WITH A SCITEX WORK STATION.

Technical Notes on the Production

The page layout was designed in Aldus PageMaker 4.0 with graphics imported from Freehand and Adobe Photoshop. Photo imposition was shown in the Mac files with Zedcor Desk Draw. Microsoft Excel helped us keep track of what went where (which we could count on changing every day). Adobe Illustrator, Photoshop, Quark XPress and Aldus Freehand helped us manipulate furnished files and scans.

Circle 70 on reader service card



MAC OUTPUT MEANS NO MESSY MECHANICALS

UPDATES

What's the Difference between a Font and a Typeface?

... And what's all this about PostScript versus TrueType? Is there a difference between tracking and kerning? What is an outline font, anyway?

At Altsys, we've spent the last 6+ years understanding and developing Macintosh software for creating and editing type and fonts. And during that time, a special vocabulary has developed just for computer type. It's made up of new words and different uses of traditional typographical terms.

So, to help you understand fonts in this age of technology, we'd like to offer you a free copy of our booklet, Type Terminology on the Desktop. Just call us at the phone number and extension below or use the enclosed magazine reader reply card.



Circle 35 on reader service card.

MICROSOFT	2.0	512K/6.0		
WORKS	2,0	3121/0.0		
MINDLINK	2.0	1MB/6.0	147	
MINDWRITE	2.1	512KE/4.2		
MINICAD +	3.1	1MB/6.0	7/91	
MOCKPACKAGE		512KE/3.2		\$15
PLUS				.,.
UTILITIES				
MODELSHOP II		1MB/6.0.2		\$150
MORE	3	1MB/4.1	12/90	•
MULTI-AD	2.0	2MB/6.0.3		•
CREATOR				
MULTICLIP	2.1.7	512K/6.0.2		
MULTILEDGER	1.1	512K/3.2		\$75
MUSICPROSE	2.1	1MB/6.0		FREE
MUSIC	2.5.2	1MB/6.0		\$15
PUBLISHER				
MYDISK	3.0.4	1MB/6.0		
М.Ү.О.В.	2.0	1MB/6.0	10/91	
MYTIMEMANAGER	3.0	1MB/6.0		Ť
NETMINDER	1.2	2MB/6.0		
ETHERNET				
NETWORK	3.0	512K/3.2		*
BUNDLE				
FOR THE MAC		Yay		X
NISUS	3.05	1MB/6.0.2	2/91	
THE NORTON	1.1	1MB/4.2	2/91	\$19
UTILITIES		200000		
Now	2.0.3	1MB/6.0.2	7/91	*
UTILITIES		CONTRACTOR OF THE PARTY OF THE		
NUBASE FOR	1.3	1MB/4.1		\$75
THE MAC				
OMNIPAGE .	2.1	1MB/6.0.2		FREE
OMNIS 5	1.2	1MB/6.0		•
ONCUE	1.3	512K/4.2		\$10
ON	1.02	1MB/6.0.5		FREE
LOCATION		1840/0-		
ON	2.0	1MB/3.0		27
SCHEDULE		510vm -	W.	
PANORAMA	5.3	512K/5.0		
PANORAMA PHONENET	1.5	1MB/4.2 1MB/4.2		\$29.95
PHONENET	3.0	1WD/4.Z		3/5
PHOTOMAC	1.5	2MB/6.0.3		\$75
THE PHRASE	2.0	1MB/6.0	1/91	FREE
THESAURUS	E-0	, 0.0	- 191	, nee
PICT	2.0	512KE/6.0		\$20
DETECTIVE				
PICTUREPRESS	2.0	2MB/6.0.4		٠
PIXELPAINT	2.1	2MB/4.1	THE	
PIXELPAINT	2.0	3MB/6.0.2	9/91	\$125
PRO				
PLAINS &	1.06	1MB/3.2		
SIMPLE		The state of the s		
POWERDRAW	3.0	1MB/6.0		
POWERSTATION	Total Control	512K/4.1		
PRACTICA		512K/3.2	-	

PRODUCT	V.	REQ.	*	\$
PRO-CITE	1.3.4	512K/4.1	4	•
PRODIGY	3.1	1MB/6.0	64.8	FREE
PROFESSIONAL	2.3	1MB/6.0.3	. 18	FREE
COMPOSER				
PROGRAPH	2.0	2MB/6.0		
PROPSFORMS	2.0	1MB/6.0.3		FREE
PROTOTYPER	3.0	1MB/4.1		\$99
PUBLISH IT	1.2	512KE/5.0	1 7	
PUBLISH IT	2.0	1MB/6.0		
EASY				
PUBLISH	6.0	512K/4.2	1143	\$12.9
OR PERISH				
PYRO	4.0	512K/4.1	7	\$15
QUARKXPRESS	3.1	2MB/6.0.5	11/90	
QUICKDEX II	1.40	1MB/6.0.5		
QUICKEN	3.0	1MB/6.0.5	20100	
QUICKEYS?	2.1	1MB/6.0.2	1/91	
QUICKLETTER	1.1.5	1MB/6.0		\$25
QUICKMAIL	2.5	512KE/3.2	1	*
QUICKSHARE	2.0	512KE/3.2	ш	
QUICKSHOT	2.1	1MB/4.2		\$5
RAGTIME 3	3.1	2MB/6.0		\$150
READ-IT OCR	2.1	1MB/6.0.3		\$29
PERSONAL	72			
READ-IT OCR	3.0	2MB/6.0.3		
PROFESSIONAL	0.0	Ziriby Gidio		
READYSETGO	4.5	1MB/6.0		
RETROSPECT	1.3	1MB/6.0		
REMOTE	1.5	THIC/G.G		
SAM	3.0	1MB/6.0	2/91	\$29
SCHEDULE	3.01	1MB/6.0	231	\$25
SMART	3.06	The state of the s	12/90	Laure II
ALARMS	3.00	11410/0.0.2	12/30	925
SMART ALARMS &	3.06	1MB/6.0.2	12/90	
MULTIUSER	3.00	1140/0.0.2	12/50	
APPOINTMENT DIARIES				
SMARTCOM III	3.3	1MD/C 0 E	-	
A STATE OF THE STA	NA COLUMN	1MB/6.0.5	10.1	FREE
SMARTFORM DESIGNER	1.1	1MB/6.0		FREE
Language Committee Committ	201	1840/5 00		
SMARTSCRAP &	2.01	1MB/6.03		5.761
THE CLIPPER	212	1840000		*
SNAP		1MB/3.0		
SNAPJOT	3.0/1			
SOFTPC	1.3			•
SOUND	2.01	2MB/6.0.5		
DESIGNER II				
SPELLING	3.1	512KE/4.2		*
COACH				
PROFESSIONAL				
SPELLSWELL	2.2	512K/3.2		\$20
SPINNAKER	2.0	2MB/6.0		\$45
PLUS				
TOTATIO.	2.0	1MB/6.0		•
STATUS				
MAC		3000		
MAC STEPPING	2.02	1MB/4.1		FREE
MAC	2.02	1MB/4.1		FREE

TIMEWORKS Explodes the Myth!

Myth: You Have to Spend a Lot to get a Lot in a Desktop Publisher.

Reality: Publish It™ Easy has All the Power at One-Third the Price!

hoever said you Ideal for CLASSIC, SE, LC, IIsi get what you pay for never used Publish It! Easy. and other Because with Easy you get Macs a lot more. Re-Macintosh 1111 Publish-It! Easy bedgie

Easy-to-Learn Page Layout

Complete Word Processing

Built-in Drawing & Painting Tools

Graphic Importing and Editing

Exclusive Slide-Show Feature

Suggested Retail Price \$249.95

For those of you without an art degree, you need an affordable desktop publisher that's easy to use, a snap to learn and combines all the tools needed to create dynamic documents. In other words, you need Publish It! Easy.

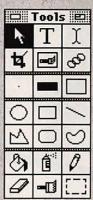
Publish

It! Easy - Version 2.1 The Affordable All-In-One Desktop Publisher for the Rest of Us!

With Easy everything is included:

- ► Easy Page Layout
- ► A Complete Word Processor
- ► A 112,000-Word Spell Checker
- ► A 240,000-Word Thesaurus
- Our Slide-Show Feature Create slides, handouts & on-screen presentations
- ▶ 72 Sample Page Layouts
- Built-in Drawing and **Painting Tools**
- ▶ A Quick-Start Mini-Manual

Easy's Palette has 21 Built-In Tools:



► PLUS NEW File < It! - An advanced Built-In Database and Mail Merge Program. Create a database; customize a form letter; select, sort, or edit the information in your database-all without leaving Easy.



NETWORK VERSION ALSO AVAILABLE!

Visit your favorite Dealer and find out why more people are making the Easy switch.

TIMEWORKS

Circle 206 on reader service card

Own Publish It! Easy for \$99 and Save Over \$150

If you already own any other desktop publisher add Easy for only \$99. If you don't love using Easy, return the program within 60 days for a full refund. Check the box below, sign the coupon and return it with your \$99 check or credit card number plus \$5.70 postage and handling, to: Timeworks, 625 Academy Drive, Northbrook, IL 60062 Or call: 1 (800) 323-7744

(Ask for Operator 10) Fax: 1 (708) 559-1360

OFFER EXPIRES 12/30/91

Yes, I own another desktop publisher.

but I would like to switch to Easy for \$99.

☐ Visa ☐ MasterCard ☐ American Express Acct# Exp. Date

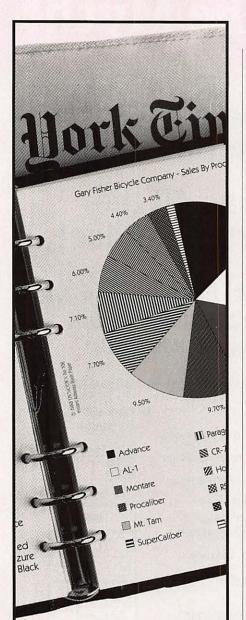
Please print:

Name

Address

City State Zip

Signature



All the files that are fit to print.

"Actually, I have that info right here." Use DynoPage[™] to print any file from any Macintosh program to personal organizersize paper (included). Carry drawings, to-do lists, and spreadsheets at all times.

And more: DynoPage prints brochures, thumbnails, custom-size and double-sided pages from ANY program.

So call us now at:

(800) SAY-DYNO

Print any Mac®File on any Page Size™

Also ask about our special \$49 offer for Dynodex 2.0. Offer ends 10/31/91.

Circle 54 on reader service card.

PRODUCT	V.	REQ.	*	\$
STRATAVISION 3D	2.0	2MB/6.0.3	111	\$99
STUDIO/8	2.0	2MB/6.0.5	6/91	\$30
STUDIO/32	1.1	5MB/6.0.5	4/91	FREE
STUFFIT	1.6	1MB/6.0	Mile	•
CLASSIC				
STUFFIT	2.0	1MB/6.0	7/91	FREE
DELUXE				
SUITCASE II	1.2.6	512KE/4.1		\$25
SUM	2.0	1MB/6.0	1	\$39.95
SUPER 3D	2.1	512KE/6.0.2		FREE
SUPERANOVA	1.1	1MB/6.0.2		FREE
SUPERGLUE II	2.1	1MB/6.0		10
WITH				
GLUENOTES				
SUPERLASERSPOOL	2.0.2	1MB/6.0		\$30
SUPERPAINT -	2.0	1MB/6.0.2		\$50
SUPERSPOOL	5.0	512K/4.1		\$30
SWIVEL 3D	1.2	1MB/6.0.5		\$49.
SWIVEL 3D PRO		4MB/6.0.5		\$150
SYSTAT	5.1	2MB/6.0		ja .
TAXVIEW 1040 PROFESSIONAL	2.12	2MB/6.0.5		\$250
TEMPO II PLUS	2.0.1	1MB/4.2		\$39.95
TEXTPERT	3.01	1MB/6.0		FREE
TEXTSCAN	3.08	1MB/6.0		\$69.95
THEORIST	1.1	1MB/6.0		*
THINK C	4.0	1MB/5.0		*
THINK PASCAL	3.0	1MB/5.0	11/90	\$69
THUNDERWORKS	1.0.5	1MB/6.0.2		
тімвикти	4.0	1MB/4.1	111	

PRODUCT	v.	REQ.	*	s
TIMBUKTU/REMOTE	2.0	1MB/4.1	2/91	
TIMESLIPS III	2.0	1MB/6.0.2		
TYPEREUNION	1.01	1MB/6.0		FREE
TYPESTYLER	1.5	1MB/4.1		
UNITIZE	1.3.5	512KE/3.2	W/	\$20
VENTURA PUBLISHER	3.0,1	2MB/6.0.5		
VERSACAD/ MACINTOSH EDITION	3.0	1MB/6.0		\$395
VERSATERM	4.5	1MB/6.0.3	H	\$20
VIREX	3.5	1MB/4.2		\$15
VIRTUAL 2.0 FOR 030	2.04	1MB/4.2		FREE
VIRTUAL 2.0 FOR MAC II	2.04	1MB/4.2		FREE
VIRTUAL 2.0 FOR MAC PLUS	2.04	1MB/4.2		FREE
WALL STREET INVESTOR	3.02	1MB/5.0		*
WHITE KNIGHT II	11.12	1MB/6.0.2		•
WILLMAKER	4.0	512KE/4.2	3/91	\$18.50
WINGZ	1.1	1MB/6.0		FRE
WORD FINDER	2.0	512K/3.2		
WORDPERFECT FOR THE MACINTOSH	2.0	1MB/6.0.5	7/91	\$89
WORKSPLUS SPELL	2.0	1MB/6.0.3		\$35
WRITENOW	2.2	512K/4.2		\$49

Screaming Scanners and Mice From Logitech!

ogitech is the world's leading mouse experts, and they bring their unique, innovative spirit to all their user-friendly products. Logitech has won a reputation for excellence by delivering advanced, precision-engineered computer products. Adding aesthetic beauty to such precision quality is compliments of Frogdesign, the exclusive designers of all Logitech products. The same Frogdesign renowned the world over for bringing you another of their original designs — the Macintosh.

MouseMan

The MouseMan High Resolution Ergonomic Mouse is like nothing you've seen before for Macintosh. Designed with the expertise of nearly a decade of mouse experience and the feedback of ten mil-



lion users world-wide, Logitech's MouseMan is the perfect mouse for everything you do. High resolution means you get more cursor motion from less mouse movement. You can adjust the resolution from 200 to 400 dpi (dots per inch) for incredibly accurate precision in all your applications.

> Lefties + **™** Righties

MouseMan features the next great advance in mouse ergonomics - left or right-handed versions with angled curves that fit your hand perfectly. These sleek beauties slip inside your palm and fit like a glove.

TrackMan

Trackman is more than a trackball and more than an ordinary mouse. It's an award-winning

pointing device in a class of its own, giving you all the advantages of mice and trackballs in one package. Perfect for people with limited desk space, it requires no room to move on the desktop.

The thumb-operated ball is smaller for easier handling, and your hand rests naturally on the ball and buttons. For perfect precision you can adjust the sensitivity from 150 dpi to 300 dpi.

Get With The Custom Click

These Logitech wonders feature three buttons to give you far superior power over any one-button mouse. The first button does everything your current mouse does - but the other two are easily customized. They do whatever you wish in each different application. Program the middle button to save a file when in MacWrite, and to import an image when in PageMaker. Tell the third to start scan-

ning in ScanMan, or to total a column of numbers in Excel. Menu shortcuts and oftenused keystrokes are now just a quick click away.

Super Hand-Held Scanner

Beware! Not all scanners are alike. The Logitech Scan-Man Model 32 fuses the advantage of software excellence with advanced hardware for superior scanning. Exciting innovations have made it easier than ever to scan photos, drawings and other images, and use them in desktop publishing, word processing, desktop presenta-tions, multi-media, graphics, database, HyperCard, or any

ScanMan achieves 32 gray scale through software for optimum laser

printer output, while advanced halftoning provides superior image quality on ImageWriter, DeskWriter or other non-PostScript printers. The included software features a 32 gray color palette and a tear-off tool palette for extra editing convenience. Output formats: MacPaint, TIFF, PICT.

FREE—Digital Darkroom with ScanMan! Enhance scanned photos. A \$299.00 value.

LOGITECH				
ER2220 ScanMan Mac w/Digital Darkroom \$299.00				
ER2210 TrackMan Macintosh				
ER2200 MouseMan Macintosh				



nanac & Atlas in One – for the **Norld Fact Book.**

igerSoftware brings you another new way to use your Mac. This product, a brand new release, puts a library of valuable information at your fingertips.

The Software Toolworks World Atlas for Macintosh is the perfect single-source reference guide for travelers, educators, business people and students of all ages. This indispensable tool brings together important information that would take months to research on your own: government, inflation rates, climate, economy and more!

Only World Atlas gives you instant access to the most accurate maps available on a personal com-

puter. Includes over 250 highly detailed, black & white or color maps of the world, regions, countries, even oceans. A huge database of international information offers valuable data on over 250 different topics in 10 categories for virtually every nation in the world!

Reports can be customized to include maps and text from World Atlas. Great for professional presentations, and made easy with point and click or keyboard commands.

Learn to navigate World Atlas in a flash! Drop down menus allow easy access to all options. Index maps let you move from map to map with a single click. And the index feature gives you virtually instant access to any map in the program.

Discover the world without leaving your chair! World Atlas can help you find everything from Crime in Costa Rica and Inflation in Ireland to Mining in Malaysia and Television in Tunisia...

A Sample of Information In World Atlas

Geography — *12 topics including:* Area, Land Use, Natural Resources and Climate.

People - 28 topics including: Population, Religion and Ethnicity Divisions, Languages and Labor Force.

Education — 11 topics including: Literacy, Educational Expenditures, Newspapers and Libraries.

Health — *21 topics including:* Access to Health Care, Calorie Consumption, Medical Personnel and Mortality Rate.



Vibrant maps with a mouse-click.

Government — 22 topics including: Legal System, National Holidays, Elections and Military. Crime - 10 topics including: Murder, Theft, Seri-

ous Assault and Drug Offenses.

Economy - 55 topics including: Exchange and Inflation Rates, Exports and Imports, Mining and Manufacturing, Energy.

Agriculture — 62 topics including: Work Force, Animals, Animal Products and Land Allocation.

Communication — 20 topics including: Transportation, Ports, Telecommunications



WORLD ATLAS

ER2225 World Atlas Macintosh \$39.95 Macintosb Plus, SE, SE/30, Classic, LC or II series. Requires System 6.02 or bigber, 7 MB bara disk, B&W or color.

International: 305-443-8212 24-Hour Fax: 305-444-5010

TO ORDER CALL 1-800-888-4437



ligerSoftware

The Brand New NEC CDR-36 \$ With FREE Adobe Font Disc!

purchased separately

N ever before has such an unbelievable offer been made on quality CD-ROM readers. NEC is a leader in computers and peripheral technology, so you know that you're getting the most advanced, trouble-free device available. The CDR-36 is now just \$399. That's it. You're ready to enter the world of CD-ROM affordably!



The CDR-36 is ultra light and easy to move around. At just 2.2 pounds, it's about the size of a hardcover book, but this quality instrument connects your Mac to the most impressive type library available. And Tiger offers you great prices on up to

Type Gallery PS (free when you order a CDR-36 or CDR-73 offers you all the flexibility and creative power of a personal electronic type house: hundreds of classic, contemporary and specialty faces on a single CD.

Since these fonts are stored on CD, they don't consume hard disk space and therefore are faster and easier to access and use more often. If you'd like to use a new typeface (already stored on the disk) later, just call NEC and unlock the ones you need at significant discounts.

The Fastest in the Business: The CDR-73.

We've also got the CDR-73 in stock and ready to ship. This is the CDR-36's bigger brother, with more speed and power for more demanding users. Call us today for to find out how NEC, Tiger and the vast capabilities of CD-ROM can change the way you use your computer.

FREE \$399 ADOBE TYPE LIBRARY With Access to 1000 Adobe®

PostScript® Language Typefaces!

The most extensive collection of typefaces available anywhere! CD-ROM technology allows you access to 1000

individual typefaces from a single CD-ROM. These high-quality typographic libraries are compatible with virtually all desktop publishing systems. And, they're not imitations — they are licensed by Adobe Systems Incorporated from famous type foundries.

1000 Typefaces on One CD!

With this free Type Gallery PC, you'll have access to your choice of 3 typeface families (up to a maximum of 15 individual typefaces) contained on the CD-ROM.

OUR "NO DOWN-TIME" GUARANTEE.

It's Tiger's iron-clad guarantee to our customers. If your NEC CD-ROM reader ever fails to perform, we'll send you a new one on the spot. No hassles. Just call us and your replacement unit is

NEC CD-ROM
ER9036 CDR-36 Reader w/FREE Font Disc \$399.00 Complete Interface Kit for Mac \$79.00
ER9073 CDR-73 Reader
instead of CDR-36 Add \$399.00
Internal reader available — please call.
NEC TYPE GALLERY
ER9230 Type Gallery PS Premium,
all 520 PostScript Language Typefaces
(\$16.33 ea.)
(\$16.33 ea.)
NEC DESKTOP PUBLISHING
ER8205 Clip Art 3-D, 2500 color images \$399.00
ER8000-4 Photo Gallery, 1500 stock photos \$399.00
FR8325 Image Gallery Premium
2800 Metro Images (\$0.25 ea.) \$719.00
ER8005-3 Image Gallery, any 600 on CD
(ea. \$0.67)
ER8015-1 Image Folio, 4000 stock photos \$399.00
CD-ROM SOFTWARE
OEM8510 Toolworks Illus. Encyclopedia \$49.95
OEM8596 Sherlock Holmes
OEM8597 Shakespeare
OEM8598 Birds of America\$29.95
OEM8580 U.S. History \$29.95
OEM8590 Guinness World Book of Records \$29.95
OEM8575 Time Table of History \$29.95
OEM8896 Ocean Imagery\$29.95
OEM8897 International Graphics Library \$39.95
OEM8898 Sports Room\$29.95
OEM8900 Desktop Publishing\$29.95
OEM8901 The Orient\$29.95
OEM8902 Classroom \$29.95
OEM8903 Game Room (750 games) \$29.95
OEM8904 Workroom (productivity software) \$29.95
Prices subject to change. Limited availability.

Design Your Dream **House on Your N**

o ahead - design that new addition to your o anead — design that new addition to york on the interior, then plan the perfect landscape. Experiment with different layouts, colors, shapes and arrangements with the Design Your Own Home Series for the Mac. It's fast, easy and fun - the results are clean, precise and professional. It's your home, who could design it better than you?

These three simple-to-use computer aided design systems include dozens of sample floorplans, pre-drawn furnishings, plants, flowers, trees and shrubs. You can modify them to suit your taste, or start from scratch to create just the environment you've been dreaming of. The Design Your Own Home Series is fast and easy — yet contains enough power for professional use.

ARCHITECTURE

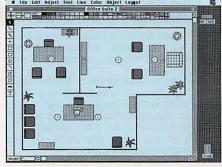
You can create a designer home right on your Mac. Instantly draw floorplans, building side views and structural details. Rearrange your ideas, add notes and labels. Design Your Own Home automatically calculates distances, areas and angles, and uses all appropriate standard architectural scales. There's a complete library of pre-drawn architectural shapes and symbols — just click to choose windows, doors, stairs, bathtubs and more. Add color overlays of electrical systems, plumbing plans and stud tool lumber estimations. You'll insert icons, grids, snap lines, stud/beam repeaters, text, circles, ellipses, boxes, arcs and more. Perfect for home, school or professional use. When you've got the perfect design, print a copy.

INTERIORS

Bring your own unique interior design ideas to life with Design Your Own Home Interiors. This remarkable system is easy-to-use yet extremely powfurnishings and they're Arrange automatically kept to scale! Explore the possibilities of color, texture and experiment with wallpaper. Select from dozens of pre-drawn furnishings and shapes, or create your own in seconds.

LANDSCAPE

Ask any real estate profes-sional, they'll tell you that landscaping can significantly increase the value of your home. In any given neighbor-hood, two identical homes may sell for many thousands of dollars difference because of the care taken to enhance the look of the property. Whether you do the work yourself or hire a landscaping firm, you must plan a landscaping project carefully to achieve great results. Design Your Own Home Landscape



allows fast, easy planning with a variety of useful tools. First, flip through dozens of sample plans included. You can use them as is, with modifications or just as ideas to create your own plan. Change the scale of trees and shrubs to put shade in the right places, arrange plants, steps and walks exactly the way you want quickly. You can even "age" trees, shrubs and plants to see how they'll look when matured

Take a look at what you've designed from a variety of views: overhead, side, north, south, east and west perspectives. Then, see a detailed list of everything you've "planted" for accurate pricing. Includes library of trees and shrubs.

BUY ALL 3 -– SAVE \$30.0!



DESIGN TOON OWN HOUSE	-
ER2001 Architecture \$	69.95
ER2002 Interiors \$	69.95
ER2003 Landscape	69.95
Requires 1MB or more; mouse, ImageWriter, LaserWriter.	

DECICAL VOLID OWAL HORSE



TO ORDER CALL 1-800-888-4437



International: 305-443-8212 24-Hour Fax: 305-444-5010

The Best Way to Improve Your Writing.

Improve Your Writing by Checking Grammar, Style, Punctuation, and More.

n business, you're judged by what you say - and by how you write. Nothing can kill the confidence of a prospective customer or client faster than a proposal littered with grammatical, usage and punctuation errors.

The fact is, there's no excuse for sloppy, error-filled written communication. Each letter, report, proposal, press release or other business document you prepare should represent you as a professional.

RightWriter Is the Premier Grammar and Style Checker.

RightWriter 3.1 is designed to flag errors in your writing from a rule base of over 4,500 — including rules of grammar, style,

usage, punctuation, sentence structure, subjectverb agreement and more. RightWriter produces a copy of the document and performs its analysis. Then displays (or prints) your document with flagged errors and explanations. These explanations are your guide to better writing. The result: clear, crisp documents that deliver your ideas with maximum impact.

RightWriter works with your word processor to help you make your business writing strong, clear and to the point. Not a spelling checker RightWriter is a sophisticated expert system that applies the rules of good writing directly to your

To use RightWriter, create a document with your word processor. Then run RightWriter on the document using a few simple mouse selections.

RightWriter inserts comments into your document pointing out problems in style, word usage,



grammar, and punctuation. Use your word processor to make the changes you consider appropriate. Then tell RightWriter to remove its comments. The result — strong, clear business writing

How RightWriter Knows When Your Writing is Wrong.

RightWriter proofreads your documents using two artificial intelligence (AI) technologies called parsing and expert systems. Each technology has a separate, unique function, but together they rely on one another to identify parts of sentences and to locate errors

Parsing performs the critical function of sentence dissection. It first identifies sentences' individual parts, breaking each sentence into major phrases and looking for both dependent and independent clauses. Parsing goes further by identifying the subject and predicate of each clause and noting the word's part of speech. This technology, for example, can tell the difference between "can" used as a noun and as a verb.

The expert system relies on the parser to break down sentences so it can determine their accuracy. RightWriter's expert system examines your writing, judges the accuracy, and suggests improvements without your making any specific query.

The Compatible Grammar Checker.

RightWriter for the Mac is fully compatible with any document from:

- Mac Write version 2.2 through 5.0
- Mac Write II version 1.0 and 1.1
- Microsoft Word version 3.0 and 4.0 WordPerfect version 1.0.0 through 1.0.4
- WriteNow version 1.0, 2.0 and 2.2
- ... or any other standard ASCII editor.

BONUS! Strunk & White's The Elements of Style **Electronic Edition**

INCLUDED FREE WHEN YOU BUY RIGHTWRITER FOR THE MAC!

Reviewers have called it "...the best book of its kind" and raved, "The work remains unparalleled, direct, correct and delightful." Now *The Elements of Style* is available on diskette for your Mac.

Get RightWriter & Elements of Style

\$99.95 value \$59.95 value

Both Just \$59.95!

QUe software

RIGHTWRITER 3.1

Old-Fashioned Padlocked Protection!

quipment theft? Virus infection? Data security? If you worry about any of these, you need the Secure-It solution. Not just another software program for some demented hacker to break through - this is a triedmethod for serious and-true security.

Stop and think what you lose when your equipment is stolen or valuable information in.

The Model 250 has a universal fit for all 5 1/4" and 3 1/2" drives. The Models 260 and 261 are specially fitted for Macintosh computers. Quick and easy installation/removal make these a must for anyone who needs worry-free computing.

Cable Safety

Attach this strong, high-quality

10-foot cable to your equipment and then to the desk or any immovable object.



Special fasteners prevent existing screws from being removed.

your data is corrupted. Time to reload. Hardware downtime. Wasted employee hours. Inevitable confusion. Secure-It is the proven method used by government agencies, businesses, colleges and universities.

Disk Drive Lock

Very simple — very safe. Put a lock on the opening of your disk drive and pocket the key. Nothing goes in or out. Patented Disk Drive Locks keep viruses out and your

Secure-It, Inc.

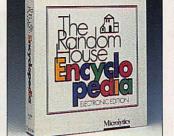
SECURE-IT

ER6010 Drive Lock 250 (PC) . . \$24.95 ER6015 Lock 260

(Mac SE, Plus) \$24.95 ER6020 Lock 261

(Mac II's, Classic) \$24.95 ER6040 Cable KAB 100 (PC) . . \$49.95 ER6030 Cable MCK 130 (Mac) . \$49.95 Federal Express shipping just \$3.00.

TO ORDER CALL



Random House Encyclopedia for the Mac!

he best-selling encyclopedia that puts a full-blown reference center right on your Mac! Simple and fun to use — without a CD-ROM player. Ideal for students, professionals, researchers, writers and a wonderful gift for young children. Just click to History, explore Geography, Philosophy/Religion/Mythology, Social Sciences, the Arts, Science, Sports and Leisure, Law, Government and more.

Using the powerful search and retireval tools built-in, you can see a quick overview of Chinese history, the advent of computers, facts about Romanian agriculture or learn how a nuclear power plant works. Click on Sports and learn about Ty Cobb, Hank Aaron and the immortal Babe

Ruth. Click on Science and travel back to July 20, 1969 and Neil Armstrong's historic moon walk, or click on aircraft and span decades from Kitty Hawk to the incredible Stealth bomber. Click on Leisure and travel through the careers of Elvis, the Beatles and Buddy Holly. Click on Buddy Holly and learn about the fateful night when the music died in a tragic plane crash over a Kansas cornfield. Click on Government and discover how George Washington was paid for his services as our first president.

Unlike its book version, The Random House Encyclopedia for the Mac contains many ways to look at information. Choose the OUTLINE VIEW for a look at categories in a verical hierarchy, or GRAPHIC VIEW in a series of scrollable columns. The FIND function lets you quickly jump between categories and the REVERSE DICTIONARY allows you to find any information with the slimmest of leads. For just \$69.95, you bring the world of facts and knowledge to your desktop. A must for every Macintosh user.

Microlytics

RANDOM HOUSE

ER2350 Random House Encyclopedia \$69.95

International: 305-443-8212 24-Hour Fax: 305-444-5010

1-800-888-4437





NO ONE HAS TO KNOW YOU DID ALLTHIS MINUTES BEFORE THE MEETING.



The meeting is in an hour. And your presentation is the main event. It's in your head, but not on paper —much less on

overheads. It's important to communicate professionally and persuasively, but there's not enough time to prepare. Or is there?

Persuasion: first choice for last minute.

Aldus® Persuasion™ 2.0 is the fastest way to create impressive visuals for all your meetings. In fact, all the overheads above were created in just 30 minutes. That's productivity no other

The meeting method or Macintosh® program can an hour. And beat—and test results prove it.

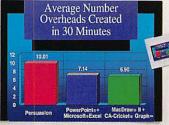
Simply type text into Aldus Persuasion's outliner, and your visuals are automatically formatted. Persuasion 2.0 is a complete solution for creating organization charts, diagrams, and a variety of graphs, with features like 36 pre-designed templates, spell-checking, and a

library of clip art. So all you provide is the content— Persuasion does the rest.

And when you're ready to print, choose from output options to suit your needs: black-and-white or color overheads, or 35mm slides from a film recorder or nationwide service bureaus.

Of Persuasion's many accolades, *MacWeek* summed it up best: "...the best presentation package available."

Need more persuasion? Call **800-333-2538**, **Department 2D3**, for free literature or a \$4.95 demo disk.* Because with Aldus Persuasion 2.0, your presentations will look like you spent days, not minutes. And we'll never tell.



In a recent performance test, Persuasion outpaced other Macintosh programs.



The Creative Edge in Business.



MACWORLD NEWS

by Dan Littman and Tom Moran

HP Adds Color to DeskWriter



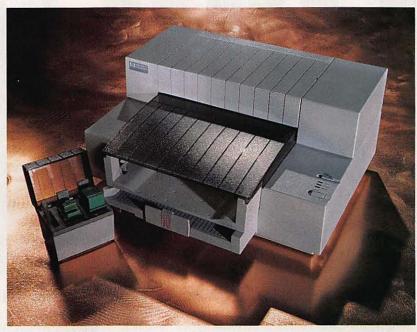
Hoping to please desktop publishers who'd like to add a little color to their work.

Hewlett-Packard has introduced a version of its popular DeskWriter ink-jet printer that can produce monochrome, gray-scale, or three-color output. Not intended as a full-time color printer, the Hewlett-Packard Desk-Writer C comes with a black-only ink cartridge and with a three-ink cartridge that can combine cyan, magenta, and yellow to produce millions of colors. The user manually swaps the cartridges when switching between black text and color graphics.

The 300-dpi QuickDraw printer produces a black-only page in about 20 seconds, while a full-color page takes around 4 minutes. HP includes a new printer driver that supports spooling, matches printer colors to monitor colors, and offers a choice of dithering patterns for creating different textures. The DeskWriter C comes with Times, Symbol, Courier, and Helvetica (the same four scalable fonts that the previous DeskWriter has) and supports Adobe Type Manager and TrueType. The printer works with System 6.X and 7.

The DeskWriter C accepts legalor letter-size paper and can print labels, envelopes, and transparencies (HP recommends using HP's LX Jet-Series transparency film for the latter).

The printer includes an AppleTalk connector and an RS422 interface. It will begin shipping on September 1 at a list price of \$1095. Owners of the DeskWriter can upgrade to the DeskWriter C at a list price of \$450.



The DeskWriter C doubles as a color printer for occasional color graphics in newsletters or presentations. The user swaps the black ink cartridge for a three-color cartridge.

HP also reduced the price of its Paint-Writer color ink-jet printer to \$995 to remain competitive with other color printers from HP. For more information, contact Hewlett-Packard at 800/752-0900.—T.M.

Alias's New World



Sketch is a drawing package under development at Alias Research that seems a bit

like Adobe Illustrator or Aldus Free-Hand—except that it draws in a threedimensional world. You create Sketch designs in a single 3-D window instead of the top, front, and side views common to most 3-D software; instead of creating single objects that you later combine in a scene, Sketch's window is the scene where you model, assemble, and assign rendering attributes to everything.

In addition to a few 3-D primitives and standard extruding and lathing, Sketch has some striking features. For example, you can draw a curved line, extrude it with a tug to make a wavy surface-and then draw right on it. You can deform an object in three dimensions by grabbing and yanking on it; Sketch senses the mouse location and creates a spline for you to reshape. Any object you design can serve as a snapping guide so that other objects will conform to its shape and location. You can import a scanned photo and incorporate its perspective in a 3-D model, or import text and apply all of Sketch's 3-D tools to it.

Unlike many 3-D packages, Sketch doesn't venture into animation, but it does store a history of every step in creating a design that you can replay; you can also roll back to a point and branch off in a different direction. (continues)

ANNE STA





The Small Business Accounting System That Thinks Big.

There's only one small business accounting system that's so innovative, so flexible, and so complete your business just can't outgrow it.

It's called Accountant, Inc. -- its capabilities will truly amaze you.

It's easy to learn, easy to use and surprisingly affordable. It does everything you would expect your accountant to do – yet it's simple enough for a novice. In fact, Accountant, Inc. is the only comprehensive, fully-integrated accounting system available for the Macintosh. It's even System 7 compatible.

It's Everything You Need. Right Now.

Whether you're alone in your company, or have dozens of employees, Accountant, Inc. lets you perform a full range of accounting and management functions seamlessly – including general ledger, inventory, payroll and payables/receivables.

You can breeze through invoicing, checkwriting, purchase orders and other tasks. Create over 100 different critical reports and analyses in seconds—to help you plan and run your business more strategically.

The fact is, Accountant, Inc. fits into the way you do business, not the other way around. It's easy to install. And there's even a nationwide network of qualified independent installers who can get you up and running. On site or by phone.

It's Just What You'll Need, Tomorrow,

When your business expands, so should your accounting system. Quickly and easily. Without any changes to your files or additional training time.

That's why it's so simple to upgrade to the MultiUser version of Accountant, Inc. that will be available in September.

AI/MultiUser will give you all the performance of Accountant, Inc. and then some. It will let everyone in your organization access important financial information -- all at the same time.

Start Building Today. Be Ready For Tomorrow.

Now is the time to take advantage of the power of Accountant, Inc. You'll not only get the benefits of the most comprehensive and flexible accounting system available today – you'll be investing in your future.

Because as a registered Accountant, Inc. owner, you'll be able to

purchase a seamless upgrade to MultiUser for a remarkably low price.

So, spend less time working on your books and more time building your business. Get Accountant, Inc. now, and MultiUser later. Then say goodbye to your accounting problems forever.

Accountant, Inc. suggested retail price: \$595; MultiUser (3 users), introductory price: \$995 (suggested retail: \$1295); Additional user modules, introductory price: \$195 (suggested retail: \$295); Upgrade to MultiUser: \$300; or \$250 if you have extended support.



Accountant. Inc. MultiUser

1(800)933-2537, 800 S.W. 37th Avenue, Suite 765, Coral Gables, Florida 33134

Softsync/BLOC

Requires: Apple Macintosh with at least 1 megabyte of memory and hard disk. Works with Plus, SE, SE/30, II, IIx, IIcx, IIfx, Portable, Classic, si, LC, ImageWriter, LaserWriter, StyleWriter, Appleshare and Multifinder. Copyright 1991, Softsync/BLOC. Accountant, Inc. and Accountant, Inc. AmultiUser are trademarks of Softsync/BLOC. Apple, Macintosh, and System 7 are trademarks of Apple Computer, Inc. All other trademarks acknowledged.



Sketch has full-featured rendering tools, including Phong and Gouraud shading, texture mapping, bump mapping, and ray tracing. It comes with a RenderMan-like library of surfaces, and Alias plans to publish a spec for developers to create more (it doesn't support RenderMan shaders). Sketch will list for about \$2000.

Alias's first Macintosh product, Upfront,

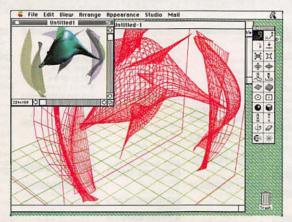
shares Sketch's one-view, direct-manipulation metaphor, but its tools create walls and solid objects rather than Sketch's lines, planes, and curved surfaces (Upfront models can be incorporated into Sketch designs and rendered). A new version of Upfront will add simulated texture maps and the ability to fly through a model by following an invisible wall. Version 2 has not been priced, but the first version listed for \$895. Alias Research is in Toronto, at 416/362-9181.—**D.L.**

MicroPhone Front-Ends Global E-Mail





Pacific Bell's Vincent Lee (left) and Miles Morimoto helped make the company's public E-mail system Macintosh-friendly.



Flexible fish: using Alias Sketch is almost like drawing in the air with a sparkler that doesn't burn out.

Using the forthcoming version 4 of MicroPhone II, Software Ventures is creating a Macintosh front end for PB Connection that hides the E-mail system's command-line interface behind buttons and icons and allows you to perform all mail functions offline.

The MicroPhone interface to PB Connection supports sending to multiple addresses; can batch-search for addresses from a list of names and save them in its address book; and can send and receive mail unattended. PB Connection supports one binary enclosure per message.

The PB Connection front end will not be modifiable, even with a copy of MicroPhone. PB Connection costs about 15 or 20 cents for a letter-size message (X.400 access adds 20 cents per 1000 characters), and there are other charges for the front-end software and a mailbox. For more information, call Pacific Bell at 800/989-9005 (or 800/675-9005 in California).

MicroPhone II version 4 will include Dialoger Pro, a utility that simplifies designing a script's interface and wiring up its buttons and other features. Version 4's System 7 features can call other programs, such as Disinfectant and StuffIt, to operate on downloaded files, or pass downloaded information to other applications, such as Excel. It adds support for the Comm Toolbox's Connection Manager and has VT220 and VT320 emulation, though it can open only one session at a time. The new script editor is nonmodal, so you can open multiple scripts and copy and paste their contents; it may have a much improved debugger as well, but at

press time Software Ventures wasn't sure that feature would be included. For experienced scripters, the oldstyle script editor is still available. Version 4 will list for \$295. Software Ventures is in Berkeley, California, at 415/644-3232.—D.L.

Iomega Doubles Bernoulli Capacity



Offering twice the capacity of its existing 45MB Bernoulli drive, Iomega Corpo-

ration has introduced the Bernoulli 90, a removable-cartridge drive that stores up to 90MB. The introduction came a few months after rival SyQuest Technology introduced an 88MB version of its 44MB removable drive, which has been the most common removable-cartridge device for the Macintosh. Iomega has long dominated the market for removable-car-



UIS DELGAD

lomega's Bernoulli 90 removable-media drive stores 90MB, about twice the capacity of the company's previous drives.

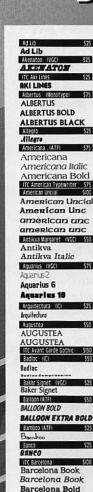
tridge drives on the IBM PC side and has priced the new drive aggressively to gain share in the Mac market.

Iomega offers the device in two Mac-compatible configurations: the Bernoulli 90 Transportable, a single-drive subsystem, and the Bernoulli 90 Dual, which contains two of the drives in one case for easier disk copying and backing up. The Bernoulli 90 has a better average access time (19ms) and higher maximum data-transfer rate (2.5M per second) than the previous Iomega removable.

All the Iomega drives use the Bernoulli effect (from the air flow pro-(continues)

Buy One Get One Free!

For a Limited Time Only



on Antique Caslon Antique Italic ITC Bauhaus Castle (IC) Bouhous Light **Bauhaus Medium** Bauhaus Bold Century Book Bauhaus Heavy BEEBOOK Benquiat Book Benquiat Bold ITC Benquiat Gothic Bengulat Gothic Century Oldstyle Bengulat Gothic Benguiat Gothic Benguiat Gothic

Barcelona Bold

Berkeley Oldstyle Book Berkeley Oldstyle Book Berkeley Oldstyle Berkeley Oldstyle

Bernase Roman Bernhard Tango (ATF) Benchard Tonoo Bisque (VGC)

Bodoni Bodoni Italic Cheltenham Bold Bodoni Bold **Bodoni Bold Italic Bodoni Poster** CHROME SUMPER

Bolt Bold Citi Light Book Jacket (VGC) Citi Bold Book lacket ITC BO Broadway

Broadway Eng Clearface Regular Brody (ATF) Clearface Regular Clearface Bold Brush Script (ATF) Clearface Outline ITC Busorama

RIKORAMA MEDIUM BUSORAMA BOLD

Craw Modern Caldonia Caldonia Italia Compact Light Compact Caldonia Bold Caldonia Bold Italic Carolus Roman

Cooper Black CARTOON BOLD COPPERPLATE Casino

Caslon Book Caslon Book Italie Corvinus Skyline Caslon Bold Daily Tribune Caslon Bold Ital

DAVIDA BOLD Delphin No. 1

Century Bold Ital from Casual (ATE)

Century Condensed Dom Diagona Century Condensed Century Condensed Drop Caps Century Condensed

Century Old Style Century Old Style Century Old Style ITC Eras Eras Book Eras Medium Eras Demi

Cheltenham Book Ital Eras Bold Cheltenham Bold Eras Ultra Cheltenham Bold Cheltenham Outline ITE Esti Cheltenham Cont

ITC Cheltenham Cond \$100 Cheltenham Book Cond Cheltenham Book Cond Cheltenham Bold Ital

Cheltenham Book

Claredon Book Clearface Bold Italic

arface Contour COMIC BOOK

COMIC BOOK TWO Commercial Script (ATF) \$25 rial Peript

Compact Bold Cooper Black Ital

COPPERPLATE

Didi

Dom Casual

Egyptian 505 Bold ITC Flag

Garamond Condensed **Garamond Condensed** Garamond Condensed Garamond Cond

Gill Sans Light Gill Sans Light Italic GIII Sans GIII Sans Italia

Estro Gill Sans Bold Eurostil **Eurostil Bold** Eurostil Ext

Eurostil Ext Fenice Regular Fenice Regular Italic Global

Fenice Bold Fenice Bold Italic ITC Firenze Firense

Folio Light Folio Medium Folio Bold

Folio Extra Bold Traftur

Friz Ouadrata Friz Quadrata Bold

Futura Light Futura Light Oblique Futura Book Futura Book Oblique Futura Medium Futura Medium Obl Futura Demi Bold Futura Demi Bold

Futura Bold Futura Bold Obl Futura Extra Futura Condensed lia

Futura Condensed Medium Futura Condeased Medium Obl Futura Condensed Demi Bold Futura Condensed Ext Futura Condensed Ext

GALLIA Galliard Roman

Galliard Bold Galliard Bold Italic TTC Garamond

Garamond Light Garamond Ligh Garamond Book Garamond Book Garamond Bold ITC Caramond Condensed SISO Garamond Condensed

Gill Sans (Monotype)

Gill Sans Bold Italic Gill Sans Ultra Gillies Bothie Light

Gillies Gothic Bold lobal (VGC) Gold Rush (ATE) OLD RUSH

Gorilla Goudy Italia Goudy Bold

Goudy Bold Italic Goudy Oldstyle (ATF) Goudy Oldstyle

Goudy Oldstyle Italic ITC Goudy Sans ERAPRIT. REAPPLY SHARRY

Grizzly Grouch Guts IVEC Guts

Hallmarke Light Hallmarke Light Obl

Hallmarke Black Hallmarke Black

Hallmarke Condensed (IC)\$200 Hallmarke Condensed Light Hallmarke Condensed Light Hallmarke Condensed Hallmarke Condensed Hallmarke Condensed

Hallmarke Condensed **Hallmarke Condensed** Hallmarke Condensed

Hobo (ATF) Image Club" (IC)

Market Hebrida fustrial Press (IIC) INDUSTRIAL

ITC Italia

Italia Book

Italia Medium Italia Bold

IVY LEASUE OPEN

Kabel Medium Kabel Demi Kabel Bold Kabel Ultra Kabel Contour

Kaufmann Script (ATF) SSO ITC Koringa

Korinna Regular Korinna Kursiv Korinna Bold Korinna Bold Kurs

ITC Leawood eawood Book Leawood Book Italic Leawood Bold

Leawood Bold Liberty (IC) Liberty

Liberty Outline ITC LSC Con LSC COSDESSED

ITC LSC Manhattan LSC Marhattan

MACHINE MACHINE BOLD

MICH EHT

MICROGRAM MICROGRAM MICROGRAM CONDENSED

MICROGRAM MICROGRAM

Mini Pics (IC) ◆ ●●●キューマ

Histral ITC Modern No 215

Modern No. 216 Modern No. 216 Modern No. 216 Modern No. 216 Modern No. 216

Modern No. 216 Murray Hill (ATF) Mussay Till

Mar ay Will Bold ITC Neon NEON

NEULAND

Medican Carnal Saripe ITC New Baskerville New Baskerville

New Baskerville New Baskerville New Yorker New Yorker Engrave News Gothic (ATF) News Gothic **News Gothic Bold**

ITC Newtext Newtext Light Newtext Light Newtext Book Newtext Book Newtext Reg Newtext Rea Newtext Demi Newtext Demi

ITC Novarese Novarese Book Novarese Book Italic **Novarese Bold** Novarese Bold Ital

Olive Antique Olive Antique Olive Antique Olive Antique Olive Antique

Olive Antique Olive Ant Olive Ant Omni (IC)

Omni Omni Italic Omni Bold Omni Bold Italic

Omni Black Organda (VGC) ORCANDA BOID

P T Barnum (ATF)

Paner Clin (VCC)

PAPER CLIP SOLID papir clup our Park Avenue (ATF)

Piano (iC) PIANO LIGHT

ITC Pioneer Playbill

POINTILLE Ouorum Light

Quorum Book Quorum Bold

Reporter Ro A-A-Billy Salto

GUARANTEE: CUARAN STAMP STEELPLATE STENCIL ITC Stymie Hairline tymie Hairline

Surf Stule Surf Style Bold Symbol Book Sumbol Book Italic Symbol Bold

Symbol Bold Italic T H Alphabet Soun (VGC) 525 T.H. ALPHABET SOUP Thor (VGC) chor

ITC Tiffany ITC Toms Roman Too Much (VGC)

TOO HUCH OPAQ THE CONDENSED SONS Ultra Condensed Serif

Uniform 45 Light Uniform 46 Light Uniform 55 Book Uniform 56 Book Uniform 65 Bold Uniform 66 Bold Uniform 75 Black Uniform 76 Black

Berleim 36 Bitra Condensed Light Uniform 47 Condensed Uniform 48 Condensed Uniform 57 Condensed Uniform 58 Condensed Uniform 67 Condensed Uniform 68 Condensed

ITC Usherwood Usherwood Book Usherwood Book Usherwood Bold Vivaldi (VGC)

Weidemann Book Weidemann Book Italic Weidemann Bold

For a FREE catalog featuring all 600 Image Club typefaces call 403 262 8008

THE LOWEST FONT PRICES EVER Purchase a font at our regular price of only \$25 and receive a second font of your choice for free (\$100 minimum order). Order

today, this offer expires on October 31, 1991.

THE IMAGE CLUB TYPEFACE LIBRARY We've developed 600 licensed typefaces in Mac and PC format. All fonts are separated by family and available on diskette or as a complete 600 font collection on either of our two CD ROM discs; The Art+Type Vendor™ and The LetterPress®

MACINTOSH FORMAT Mac fonts include Type I and Type 3 PostScript®. This assures compatability with any Macintosh application including Adobe Type Manager™. Each Image Club font includes outline artwork of each character. This makes customizing individual characters with Illustrator® or FreeHand™ a breeze. Creating unique type based designs has never been easier.

PCFORMAT

Image Club Type for the PC is compatible with Ventura Publisher®, Corel Draw!™, Adobe Type Manager, Aldus PageMaker™ and most Windows® applications. Use Image Club typefaces with any PostScript® printer or non-PostScript printer such as HP LaserJet®. For non-PostScript printers, ATM™, CorelDrawlor a PostScript interpreter is required.

CD ROM FORMAT The Art+Type Vendor CD ROM (Mac only) puts every Image Club font and clip art image on your desktop with pay as you go access. To buy fonts from ATV™ call us toll free and we will give you the access key that immediately unlocks fonts from the CD ROM disc. With the Art+Type Vendor you'll never miss another deadline waiting for a font to arrive. The LetterPress CD ROM is our entire collection of 600 fonts on one single CD ROM disc available for the Mac or PC.

Individual Fonts \$25 - Complete families only LetterPress CD ROM \$3999 - Includes all 600 fonts Art+Type Vendor CD \$99 - includes 20 fonts & I volume of art

HOW TO ORDER Select the fonts you want at \$25 each (complete families only) 2 Select the same number of fonts you want for FREE (complete families only)

With credit card ready call the FontLine Orders placed before 4pm MST are shipped the same day.







duced by the spinning of the disk) to bring the flexible disk and the read/write head closer to each other during operation. If shock or a dust particle interrupts the air flow, the disk and head move apart, making a head crash extremely unlikely. Once the shock or particle is past, the disk and head move back and operation resumes. As a result of this design feature, Iomega says, the drives have very high reliability.

Iomega is currently shipping both the Bernoulli 90 Transportable and the Bernoulli 90 Dual. The Transportable carries a suggested retail price of \$1149; Dual goes for \$2249. For more information, call Iomega Corporation in Roy, Utah, at 801/778-1000 or 800/456-5522.—T.M.

Exploring Data



Exploratory data analysis (EDA) is a tool for making sense of numbers by look-

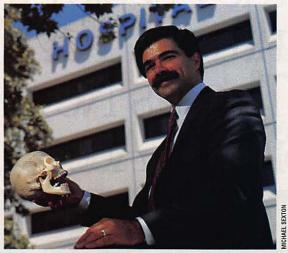
ing at them displayed as interactive graphics. The field continues to generate news on the Mac.

Data Desk's new publisher, Data Description, says the next version of its EDA package will take advantage of System 7 to access numbers stored in databases and spreadsheets and to communicate with other applications such as GeoQuery. Although Data

Desk and GeoQuery have each left Odesta's nest for separate companies, System 7 lets the two applications pass data and analyses back and forth. At press time, no price or shipping date for the Data Desk upgrade was set. The current version, Data Desk 3.0, lists for \$595.

D² Software has turned the marketing of its EDA pioneer, Mac-Spin, over to Abacus Concepts, the developer

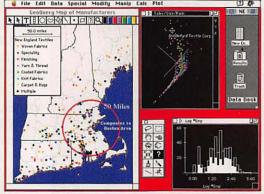
of StatView. The greatly expanded MacSpin 3.0 provides, besides MacSpin's trademark rotating 3-D scatterplots, a variety of interactive 2-D charts with data-masking and data-slicing, and support for changing vari-



Bryan Dieter thinking about brains—past and future. He uses BrainMaker to solve complex problems for hospitals.

ables and scale on the fly. Abacus Concepts claims that interapplication communication means users will find several smaller applications like MacSpin and Abacus's own StatView more effective than a big all-in-one program. MacSpin 3.0 lists for \$295.

Other important EDA vendors are sticking with the large-function-set approach. The SAS Institute's new System 7–ready version 2.0 of JMP is almost twice as big as the original release. The first version of JMP depended mainly on exploratory data graphics, while the new version responds to users' requests for additional standard tests, including capa-



If Data Desk's 3-D spinning scatterplots aren't enough for you to grasp your data, try mapping it in GeoQuery.

bility analysis; repeated measures and multivariate analysis of variance; random effects; nonlinear regression with exact likelihood-based confidence intervals; multiple comparisons; homogeneity of variance tests;

nonparametric tests; normality tests; statistical power and sample size calculations; and correspondence analysis. Version 2.0 also has more chart types, including real-time Shewhart control charts for quality analysis, Pareto charts, profile plots, and overlay plots. JMP's strength in quality control takes advantage of System 7: IMP can now monitor manufacturing-inspection processes in real time, summariz-

ing and charting results. JMP 2.0 is shipping now and lists for \$695.

Data Description is in Ithaca, New York, at 607/257-1000; Abacus Concepts is in Berkeley, California, at 415/540-1949; SAS is in Cary, North Carolina, at 919/677-8000.—Charles Seiter

Software Brains

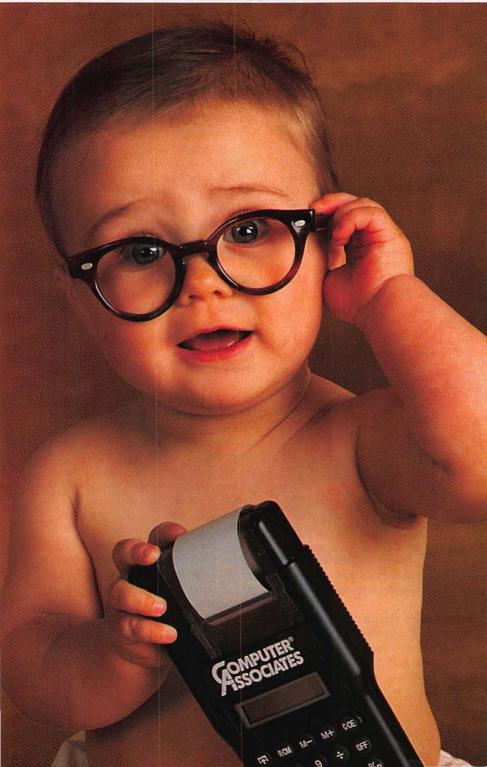


California Scientific Software claims its BrainMaker neuralnetwork software is so smart

it can design its own brain. All you do is feed it lots of data about a problem and give it some examples of correct answers, and BrainMaker performs something like a massive regression analysis to figure out how to make the jump from the data to a right answer.

Neural-network software is a mysterious technology. In standard procedural programming, the programmer knows every step that the software takes to compute a solution. A neural network, by contrast, gets no math and no rules to follow. It passes data into an inscrutable hidden layer, where dozens or hundreds of interconnected neurons—the neurons can be chips or simulated in memoryadd, multiply, and otherwise combine their signals until an answer pops out the other side. While training itself, the system compares the result to the answer it is trying to match and then repeats the process until it homes in on the target. When it gets pretty ac-(continues)

Some People Are Born Accountants. For The Rest Of Us, There's New ACCPAC Simply Accounting.



Easy To Learn, Easy To Use And Only \$199.



Now there's an gram anybody can use-new ACCPAC® Simply Accounting,™ the quickest and easi-

est way to take care of your books.

You'll have it up and running in minutes. And you can do anything with just a few clicks of the mouse. Write a check. Print out an invoice. Do your payroll. Manage your receivables.

What used to take hours now takes just minutes. So you can spend less time counting CA's Computing Architecture For your money—and more time making it.



And since it costs only \$199, you can take care of your books without breaking the bank.

Call us today at 1-800-531-5236 in the U.S. or 1-800-663-6904 in Canada for the location of your nearest dealer.

It's the accounting program anybody can use.

And we mean anybody.



For Only \$199 You'll Get: · General Ledger Accounts Payable · Accounts Receivable · Payroll Inventory Control · Job Costing · Prints Checks, Statements, Invoices and Mailing Labels · Produces Standard Accounting Reports · Quick Set-Up

©1991 Computer Associates International, Inc., 711 Stewart Avenue, Garden City, NY 11530-4787. All trade names referenced are the trademarks or registered trademarks of their respective companies.

Circle 10 on reader service card



curate, the network is ready for use on live data with no preset answers.

At the Decision Support Group in Oakland, California, Bryan Dieter feeds hospital databases—medical records, patient billing, test results—to BrainMaker to help doctors identify optimal treatment for a wide range of medical conditions. "There are hundreds of variables," Dieter says. "One of the nice things about BrainMaker is that . . . it will figure out which ones make a difference and which don't."

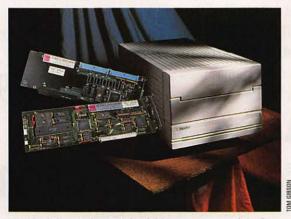
Dieter's background is in health care, not computers, but he says BrainMaker is easy to use. "The hard part is getting the data into a [format] that BrainMaker can read. . . . Hospitals have not done a good job of generating information."

BrainMaker is shipping now at a list price of \$195. For further information, contact California Scientific Software in Grass Valley, California, at 916/477-7481.—D.L.

High-Speed Hard Drive Stores 1.3GB

Aiming at applications that require very high speed and massive storage capacity,

Storage Dimensions has introduced a line of 1.3GB hard drives that work with two Data Cannon boards that hook directly into the NuBus or into the IIfx's PDS slot instead of through the Mac's SCSI port. Called the MacinStor Series 1300, the drives come individually or with two drives or four drives combined in one case.



The MacinStor Series 1300 hard drive can use one of the Data Cannon boards (shown) to transfer data very fast.

The Series 1300 has an average seek time of 11.5ms and comes with a SCSI-2 interface for faster transfers. However, the drive really takes off when used with one of the Data Cannon boards. Both boards contain high-speed SCSI interface chips that mediate between the Series 1300 and the Mac's NuBus. The sustained transfer rate of the Data Cannon NuBus is up to 5MB per second, while the Data Cannon PDS for the Macintosh IIfx can reach a sustained data rate of 10MB per second.

The Series 1300 list prices start at \$8449 for one drive, and range up to \$32,599 for the four-drive configuration. All the drive configurations began shipping in June. The Data Cannon PDS and Data Cannon NuBus both list for \$859 and are currently shipping. For further information, contact Storage Dimensions in San Jose, California, at 408/879-0300.—T.M.

E-Machines Shows 16-Inch Color Monitor, Upgradable Adapters



E-Machines recently introduced a low-cost 16-inch color monitor and a pair

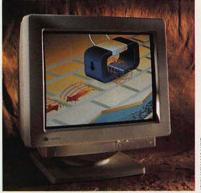
of user-upgradable accelerated graphics-adapter boards for NuBus Macs. The monitor, called the Color-Page E16, lists for \$1595. It can display at 640 by 480, 832 by 624, or 1027 by 768 pixels, and works with E-Machines' NuBus boards or with the built-in video on the Mac

LC, IIsi, or IIci.

The two new boards are the XL8. an accelerated 8-bit graphics adapter, and the Futura/24, an accelerated 24-bit board. Both boards offer panning (in hardware), 200-percent zooming, and virtual screens, and both can also produce PAL and NTSC video output. The XL8 starts out supporting 640 by 480 resolution on 16-inch monitors, but the user can upgrade the board to 24-bit color at 832 by 624 resolution. The XL8 is also compatible with 12- and 13-inch monitors.

The Futura/24 begins at 24 bits, supporting only 12- or 13-inch monitors. With the user upgrade, it can drive a 16-inch monitor at 832 by 624 resolution.

The E-Machines XL8 board lists for \$995, and its 24-bit upgrade is \$500. The Futura/24 board also has a list price of \$995, and its upgrade is also \$500. For more information, contact E-Machines in Beaverton, Oregon, at 503/646-6699.—T.M.



HN WILLIAM LUN

The ColorPage E16 monitor works with Nu-Bus display adapters or the built-in display controllers on the LC, Ilsi, or Ilci.

Synthetic Motion



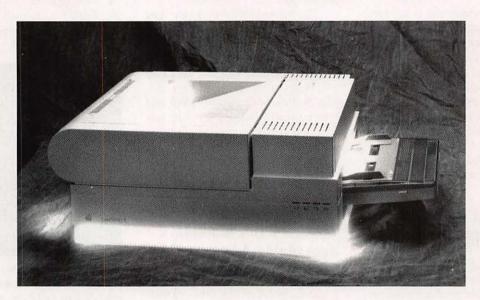
George Lucas won't be the only one directing the digital actors of the future. Life

Forms, a new software package from Kinetic Effects, already enables Mac animators to create 3-D characters that can walk, dance, play sports, and move like real people.

Life Forms includes a body-shape editor that allows you to position a human figure on the screen, a timeline editor that takes care of tweening (moving between user-defined positions), and a stage for playing back animations. Early advocates of the package include the renowned choreographer Merce Cunningham, who used Life Forms to choreograph his recent work *Trackers*.

Life Forms models are fairly simple, like sleek modern manne-(continues)

Deep Inside Your Old Laser Writer Lurks A 600 x 600 dpi Superprinter.



(You Just Have To Know How To Coax It Out.)

If you have an Apple LaserWriter,® you already have the makings of a superprinter. Just install an Accel-a-Writer™ controller board, and instantly convert any LaserWriter to a higher-speed, higher-resolution laser printer.

You get crisper, tighter images (600 x 600 dpi). And thanks to high-speed RISC technology, you'll be firing out text, graphics and complicated halftones up to 20 times faster.

But that's just half the story. Ask us about simultaneous Mac/PC printing, dual page processing, and SCSI ports, too.

Call us toll-free. See how easy and affordable it is to

coax a superprinter from 1-800-926-8839

Accel-a-Writer™



October 21-25, 1991 Las Vegas, Nevada



T E © 1991 XANTE Corporation. XANTE Accel-a-Writer is a trademark of XANTE Corporation. Other brands and product names are trademarks or registered trademarks of their respective bolders. XANTE Corporation: 23800 Highway 98, Post Office Box 518, Montrose, AL 36559 USA, TEL: 205/990-8189.

Circle 218 on reader service card



VIRUS X WATCH

Current viruses, Trojan borses, and worms affecting the Macintosh community.

ZUC C

Type: Virus

First listed in Virus Watch: 10/91

Info: A ZUC clone.

Impact: Nondestructive; infects applications and system files; renders cursor inoperable.

HC

Type: Data Virus

First listed in Virus Watch: 6/91

Info: Infects HyperCard stacks.

Impact: Causes the Mac to hum oddly.

пСАМ

Type: Virus

First listed in Virus Watch: 5/91

Info: An nVIR clone.

Impact: Nondestructive; infects applications and system files; can cause crashes.

quins, but you can modify their proportions, call a rendering program to color and texturize them, or animate more realistic figures constructed in products like Paracomp's Swivel 3D. You can play back Life Forms animations in HyperCard or include them in MacroMind Director animations.

Two teams developed Life Forms

one working on the Mac and one on Silicon Graphics (SGI) machines. Though the SGI team had the advantage of those platforms' greater power, the Mac team arrived at features unique to its version. These include automatically detecting collision with the floor and the ability to view a figure from three angles at once. The SGI version simulates gravity and enables users to synchronize animations with camera motions and MIDI sequences. Future versions of Life Forms, which will include inertia and the ability for models to detect collisions with other models, are being developed for both machines.

Life Forms requires a Mac with 2MB of RAM and a 13-inch color monitor, but does not require a math chip. Kinetic Effects distributed a prerelease version of Life Forms for \$1200,

but a final price was not set at press time. Kinetic Effects is in Seattle at 206/283-6961.—Ann Garrison

File Edit Text Records Forms Window Gradebook Trade High School Geometry is period Ord Quarter Pirst Name: Smith Coil 2 Trade U 5 Ouiz 1 Trade U 5 Ouiz 2 Trade U 5 Ouiz 4 Trade U 5 Ouiz 5 Trade U 5 Ouiz 6 Trade U 5 Second Trade U 5 First G D 1 Browts O 1 Class Avg. David S.

A database document in GreatWorks. Integrated software for the Mac is suddenly becoming a hot market.

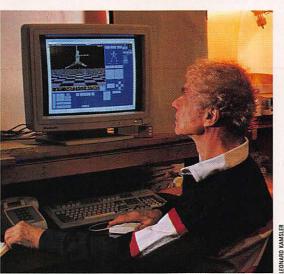
Down at the Works



There are two ways to design integrated software: the Rag-Time way and the Microsoft

Works way. The RagTime way has spreadsheets, word processing, graphics, and database windows living side by side in frames on the same page. The Microsoft Works way keeps each kind of data in a separate document, almost as if the package were several different applications.

A while back, TML Systems announced but never shipped a Workskiller, code-named Zebra, that was



Merce Cunningham at work on his Silicon Graphics machine, using Life Forms to choreograph Trackers.

clearly based on the Microsoft model. Symantec recently acquired the company and renamed Zebra as Great-Works. Great-Works outdoes its rival by several steps, with eight modules that include a word processor, database, spreadsheet, charting, outliner, draw, paint, and telecom (Works has neither outliner nor paint).

The modules share many tools. For example, the text tools you use in the word processor are available in the spreadsheet and database, including the dictionary and spelling checker, and the spreadsheet's functions are also available in the database (the spreadsheet module implements the same formulas and functions as Excel, but it has no macros or array capability). The outliner is more like Acta than More, but you can set text styles for each level. The word processor supports snaking columns and headers and footers, and provides a list of fields from a database to create mail merges, but lacks true style sheets. The draw window is color, but the paint window is black and white. There is no hot-linking between modules, so changes in one won't be automatically reflected in another.

Other integrated packages are coming to the Macintosh (look for one from Claris to be frame-based); maybe some competition will get Microsoft to rework Works. Symantec plans to ship GreatWorks before this issue goes to press. It lists for \$299. For further information, contact Symantec in Cupertino, California, at 408/253-9600.—D.L.

(continues)

"I don't think we're in Kansas anymore, Toto."



You'd be surprised where the new HP ScanJet IIc scanner can take you.

Our improved 8-bit grayscale brings you black & white that you once only dreamed of. And our new 24-bit color helps give your output magical impact. Both come with true 400 dpi quality.

Our new HP AccuPage technology combined with your OCR software makes text scanning better than ever. And with our automatic document feeder, you can scan up to 50 pages in quick succession.

When it comes to scanning color, the ScanJet IIc only



The HP ScanJet IIc makes it easier than ever to create a great image.

The new HP ScanJet IIc opens up a whole new world. With better black & white. And color.



needs to make one pass. So you scan color images faster than you can click your heels three times.

Of course, the ScanJet IIc is compatible with all major software. And it's only \$2,195* for IBM ATcompatible and Micro Channel. Or only \$1,995* for Macintosh.

For the nearest authorized HP

dealer or for more information, call 1-800-752-0900, Ext. 2548.† You'll experience awes like never before.

HP Peripherals When it's important to you.



Circle 213 on reader service card

The World's Smallest Hard Drive And Other Big Ideas From Jasmine.

THE CLIPPER:

Carry a hard drive in your shirt pocket.

The world's smallest hard drive

Weighs less than 10oz

Withstands shocks over 100G's

3" x 1" x 5"

Plugs into back of any Mac



REMOVABLE: Jasmine SyQuest Removable 45 From PORTABLE: For the price-conscious



COLORVUE: Color at a black & white price



MORE JASMINE BREAKTHROUGH FEATURES!

 External pocket clip for mobility
 External SCSI selection switch
 No Termination required
 Standard Mac SCSI pass through plug available for other peripherals . Two-year warranty Sub 20-millisecond access time

 Includes cartridge and cables
 24-hour factory burn-in Dust-free • Reliable • Designed for reliability • Close front Bezel for dust-free environment and filtered air intake • New software corrects 99% of bad sector problems through on the-fly relocation • Over engineered auto switching power supply with externally accessible fuse • Exclusive active Termination automatically adjusts the settings • SCSI address switch adjustable from push button . New init allows mounting of cartridges from all competitive vendors including Mass Micro, Rodime and PLi

 Fast (from 19ms) Exceptionally quiet (less than 35db)
40-120MB 2 SCSI 50-pin connectors Exclusive active Termination • External SCSI switch • Low power insures Mac compatibility

 14" high-resolution color monitor • 640 x 480 resolution • Palette of 256 simultaneous colors • Tilt/swivel base • Power-on and control switches on front • Non-glare screen

SAVE A BUNDLE ON SOFTWARE WHEN YOU BUY JASMINE DRIVES AND MONITORS!

Jasmine's special relationship with leading software manufacturers can save you a bundle. Now you can build your software library for just a fraction of the normal retail value.*

LIBRARY A - "Utilities"

Sum II from Symantec; Virex from Microcom; DiskDoubler from Salient.

LIBRARY B - "Office Productivity"

Write/Now 2.0 from T/Maker; QuickDEK; **Business Letters and Sales Letters from** Lightning Word; ClickArt Sampler by T/Maker.

LIBRARY C - "Fonts"

Fluent Laser Fonts from Casady & Greene (79

LIBRARY D - "Entertainment Package"

Crystal Quest; Mission Starlight; Sky Shadows.

After Dark: DiskDoubler: Virex: Retrospect May be added to any of the above libraries.

* Jasmine Libraries are available only at the time of Drive/Monitor purchase.





To Order With Your Visa or MasterCard in the USA, Call:

Prices may change without notice. 1991 Jasmine Technologies, Inc. 1225 Elko Drive, Sunnyvale, California 94089. Featured products and pricing are valid in the 50 United States. For international inquiries call (408) 752-2900 or fax (408) 752-2916.

Circle 126 on reader service card



Our survey indicates that the majority of responding readers are not intimidated by online services, with 61 percent rating them either extremely easy to use or very easy to use.

Articulate Systems Unveils Sound Recorders



To provide advanced sound capabilities from within standard application software,

Articulate Systems has upgraded its Voice Record sound-editing software and bundled it with two new sound recorders, the Voice Impact and the Voice Impact Pro. Voice Record version 2.0 has an improved, one-window interface that works as a DA or can be used to record and edit sounds from inside most applications that are compatible with Articulate Systems' Sound Manager or the Apple Sound Manager.

The software also works with the built-in sound capability of the Macintosh LC and the IIsi, or with Farallon's MacRecorder sound re-

corder. Some of the compatible applications are Excel 3.0. Microsoft Mail 3.0, QuickMail 2.2.3 and later versions, Full-Write Professional, Mathematica, WordPerfect Office. Users can edit sounds and change the compression ratio at which the sounds are stored. Voice Record bundled SoundWave, a \$69 stand-alone application that creates multiple editing windows, and mixes, filters, and adds effects to sounds.

The Voice Impact sound recorder includes a microphone, some other electronics that provide automatic gain control, and the Voice Record 2.0 software, but without the SoundWave application. Slated to begin shipping in early August, the Voice Impact lists for \$119 and is available at a discount in packs of five and ten units. The Voice Impact Pro adds a digital signal processor for advanced features, including on-board compression. The DSP allows the Voice Impact Pro to record or compress without tying up the Mac's CPU. Also scheduled for August shipping, it lists for \$249, including Voice Record 2.0 and SoundWave. For more information, contact Articulate Systems in Woburn, Massachusetts, at 617/935-5656.-T.M.



Two sound recorders from Articulate Systems: the Voice Impact (below) and the Voice Impact Pro.

Reader Survey: Online Services



This month's survey takes us into the realm of online services, with 41 percent of re-

sponding readers saving they are currently registered users of at least one online service. CompuServe was the most frequently mentioned service, cited by 50 percent of registered customers. AppleLink was next at 31 percent, with America OnLine following at 28 percent, local bulletin boards at 25 percent, Prodigy at 24 percent, and GEnie with 20 percent of registered customers saying they used it. Other services mentioned include Connect at 8 percent, MCI Mail at 7 percent, Usenet at 3 percent, The WELL at 2 percent, and BIX and Delphi at 0.8 percent each. Figures add up to more than 100 percent because this question allowed for multiple answers.

Apparently the difficulty of using an online service has been overstated, since 15 percent of *Macworld* readers who are registered users say that the service they use most is extremely easy to use, 46 percent say it is very easy, and 29 percent say it is somewhat easy to use. Only 7 percent of those readers said their online service was not very easy to use, and a mere 1 percent said the service was not at all easy to use.

Responding readers who are registered users said the features they accessed were general information (80 percent), electronic mail (59 percent), technical support (59 percent), research (55 percent), special-interest groups (46 percent), instant communication with others online (39 percent), shopping (23 percent), games or entertainment (20 percent), and other (13 percent).

Most readers who subscribe to online services said they have a 2400-bps modem (60 percent), while 9600-bps and 1200-bps modems are each owned by 13 percent. Of those readers, 7 percent said they connected less than an hour a month, 48 percent said 1 hour to less than 5 hours, 20 percent said 5 hours to less than 10 hours, 11 percent said 10 hours to less than 15 hours, and a small percentage responded in each of five higheruse categories.—T.M.

Tomorrow's pgrade For Your Mac Is Only TRANSTRUE



MORE BRAIN POWER FOR YOUR MAC

Never again will you have to quit your word processor just to answer a question about a spread-sheet. Install extra memory and you can leave your letter open while you refer to last month's sales figures. You can edit those monstrous scanner files with advanced graphics applications or develop your own custom HyperCard stacks. More memory means more power at your fingertips.

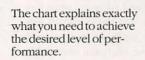
PLUG IN INSTALLATION

Adding memory doesn't require technicians in lab coats. Just open your Mac, slide out the main circuit board and plug in your SIMMS. Our FREE video will give you STEP-BY-STEP installation instructions. Every type of Mac is covered and we think we've made it a breeze.

	THE RESERVE TO SERVE THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED
-	Sant senter
10001-01100-0	
Making anness and	A STATE OF THE PARTY OF THE PAR
Participation of the last of t	Colombia de Calendria de Calend
	- Constant
100000	The state of the s
	Macintosh SE

WHAT DO I NEED?

Our helpful sales and technical staff is standing by to answer any questions and take the mystery out out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs-(2@\$59 ea.).



To upgrade a 4-socket Mac Plus or SE to this amount of memory.	Do this: (Install in multiples of two only)
2 MB	Remove all four existing 256K SIMMs, install two 1 MB SIMMs, leave two sockets for future expansion.
2-1/2 MB	Remove only two 256K SIMMs, install two 1 MB SIMMs.
4 MB	Replace all four 256K SIMMs with four 1 MB SIMMs.
To upgrade an 8-socket Mac II, IIx, IIcx, oe SE 30 to this amount of memory.	Do this: (Install in multiples of four only.)
4 MB	Remove all four existing 256K SIMMs, install four 1 MB SIMMs, leave remaining sockets for future expansion.
5 MB	Keep existing 256K SIMMs, install four 1 MB in remaining sockets.
8 MB	Remove all four 256K SIMMs, install eight 1 MB SIMMs.

To open your Mac Plus or SE, you'll need a specially designed tool - it's available from us as part of a handy tool kit for just \$9.

WHAT YOU NEED TO KNOW

Memory chips come factory-installed on plug-in cards, called SIMMS (Single Inline Memory Modules). Each one megabyte SIMMS card holds eight top quality, memory chips. We carry chips by all the major manufacturers like Texas Instruments, Intel and Samsung. We also carry the full line of Dove memory products.

Prices can vary a lot, based on quality, speed and demand. At press time our price for

very latest prices and availability. Our sales staff will tell you what you need and help you make your choice an easy

1MB, 100ns SIMMs is \$59. Please call for the

one.

SPEED

Do you need 80, 100 or 120 Nanosecond (ns) chips? Nanoseconds are billionths of a second, so an 80 ns chip responds faster than a 100 ns chip. The original Mac used relatively slow 150 ns memory chips. The 68020 processor reads 120 ns

(or faster) chip, and the 68030 Macs like the speedier model.

OVERNIGHT DELIVERY

Place your order by 12:00 am (E), weekdays and we'll deliver overnight for just \$3.00. There's never been a better time to consider a memory upgrade. Call our toll-free number now and tomorrow morning your Mac will be off to a brand new start.

MadVAREHOUSE 1-800-255-6227

Call toll-free Twenty-four hours a day, seven days a week. Inquiries: 1-908-367-0440 Fax: 1-908-905-9279

MACWAREHOUSE 30-DAY MONEY BACK GUARANTEE

If, for any reason, you are dissatisfied with your MacWAREHOUSE Memory Kit, you may return it for a full refund within thirty days of purchase. All you have to do is call us for a return authorization number and return this product, postage paid, in its original condition, with the

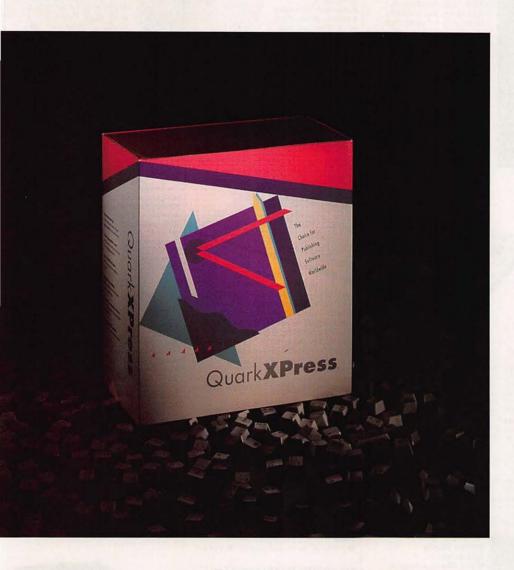
original packaging and documentation.

ONE YEAR WARRANTY. MacWarehouse also guarantees its Memory Kits against manufacturer defects for one year from the date of purchase. We will repair the item or replace it at our discretion.

SIMMs prices vary. Call for latest information

^{**} Limited Offer! Free video with purchase of 2 or more SIMMs.

QuarkXPress Delivers!



1-800-255-6227

Overnight Delivery Only \$3.00!

Call 24 hours a day, 7 days a week.

QuarkXPress 3.0

Item #DTP 0049 FaxFACTS 2509 Publisher: Quark, Inc.

MacWarehouse Low Price .. \$529

System Requirements: The enhanced QuarkXPress 3.0 requires a Macintosh Plus, SE, or II series with a 6.0 or later operating system, 2 MB of RAM (extra memory required for color or graphics-intensive applications), a hard drive, and LaserWriter 5.2 or 6.0 printer.

Powerful Tools for Your Most Creative Work

Whether you create brochures, advertising, magazines, newsletters, newspapers, or books, QuarkXPress* provides all the tools you need to realize even your most sophisticated designs. With QuarkXPress you can:

- Control font sizes, leading, kerning, and tracking to .001 unit
- Rotate text 360° in .001° increments and edit the rotated text
- Import all popular picture formats into any picture box shape, then rotate the box and the picture within it
- Apply color to text, backgrounds, pictures, frames, and lines
- · Precisely control color trapping
- Separate spot colors and print process color separations without add-on programs
- Use full-featured word processing power or import text from other programs into QuarkXPress page layouts
- Wrap text around irregular shapes, justify text vertically and horizontally, specify hyphenation and justification parameters, and check spelling for entire documents

No other program compares in precision, power, and ease of use for typography, graphics, layout and color. That's why QuarkXPress is the choice for publishing software worldwide.

Buy QuarkXPress 3.0 today and get a free upgrade to 3.1!

Because more than 40 new features and capabilities will be introduced in QuarkXPress 3.1, the suggested retail price for the program will increase by \$100. But you can receive a 3.1 upgrade package free when you buy and register your copy of Quark XPress 3.0 by October 31, 1991!

Many of our products come with a thirty day money back quarantee, if you are not completely satisfied. isk for details when you place your order.



OVERNIGHT DELIVERY

System 7 Compatibility: o indicates that the product will run under System 7.

TelePort, the ADB Modem (Global Village Communication)

The perfect choice for powerful yet compact Mac communication. This 2400 baud modem with MNP5 data compression packs Hayes compatibility and error-free communication. TelePort plugs into your mouse (ADB) port and provides a pass-through connector for other devices. It uses no external power supply, and leaves your serial port free for other uses!

MOD0049 \$139.

• Also, TelePortFAX includes SendFAX 9600 baud modem software. Hold OPTION as you drag FILE-PRINT to easily send Faxes worldwide. MOD0058 \$185.

Random House Enclyopedia (Microlytics)
Delivers a wealth of information to you through your Mac. Need a quick overview of the history of Peru? What are the principal agricultural products of Romania? How does a nuclear power plant work. Whenever you need to look up factual information, you can find it fast. EDU0217 \$68. The Elements of Style The classic handbook on writing comes to the Mac. It

covers five major categories (Rules of Usage, Elementary Principles of Composition, A Few Matters of Form, Words and Expressions Commonly Misused, and An Approach to Style). **EDU0242 \$35**.

MacPro Plus

(Key Tronic) • Key Tronic's new MacPro Plus keyboard is compatible with all Macintosh computers. The enhanced 105-key layout

Microlytics Nolo Press BUS0133 For The Record 2.0 BUS0132 WillMaker 4.0 Peachtree

OFIN0059 At Once! 1.2

Reality Technologies

OFIN0068 WealthBuilder (Mac)

Softsync/BLOC Publishing

OFIN0048 Accountant Inc. Teleware, Inc. @FIN0087 M.Y.O.B. 2.0

BUSINESS & PRESENTATION

TimeSlips Corp.

• FIN0129 TAL

	T TYPOLIS IIIIIOI	•
A Lastine	g Impression	
BUS0086		49.
BUS0102	Manager Edition	
BUS0103		49
⊘ BUS0087	ResumExpert (Word 3.0/4.0 vers	sion) 49.
BUS0107	Computer Science/Engineering	49.
	Concepts	
@STA0006	MacSpin 3.0	185.
@STA0008	StatView II 1.03	309.
@STA0010	StatView SE+Graphics 1.03	199.
	SuperANOVA (MacII Family)	309.
Acius		
DAT0045	4th Dimension 2.1	489.
AEC Mar	agement Systems	
BUS0129	FastTrack Schedule 1.5	
DAT0055	AEC Information Manager	409.
After Hou		
	TouchBASE	89.
Aldus		
BUS0066	Persuasion 2.0	329.
	ware Inc.	
BUS0134	Planisoft	195.
BUS0146		
	Planisoft - 10 pack	839.
Ashton-T		
DAT0042	dBase Mac S	
O BUS0054	Full Impact 1.1	PECIAL! 49.

ACCESSORIES

	ACCESSORIES	
Toner C	artridge	
	LaserWriter II	5.
Basic No	eeds, Inc.	
ACC0356		
	(grey nylon) 1	7
ACC0348	(grey nylon)	7
ACC0347	HardTops Mac Extended Keyboard Cover16	6
ACC0346	HardTops Mac Standard Keyboard Cover15	5
ACC0466	MacIlcx/ci Monitor Stand 4	9
ACC0351	Utility Pac1	
B.A.S.F.	(BASF)	•
MED0030	Disks - DS/HD 1.44 Meg (box of 10) 2	2
MED0029	Disks - DS/DD (box of 10)	2
Curtis		**
ACC0469	Command Center	9.
Ergotron		
ACC0344	MacTilt II - 13" Color RGB7	5
ACC0128	MacTilt Plus/512 - Platinum	8
ACC0009	MacTilt SE, SE/030 - Platinum 6	8.
Famous	Engineering Brand	
DAC0038	DigiMatic	79
I/O Desig	an, Inc.	
ACC0028	MacLuggage™ Plus Carrying Case 6-	4.
ACC1070	MacLuggage™ SE Carrying Case	5.
ACC0327	Monitorware Apple RGB Case7	9.
ACC0427	Ultimate Classic/SE Ext. Carrying Case -	
	Black	5.
ACC0440	Ultimate Classic/SE Ext. Carrying Case -	
	Navy 8	5.
ACC0529	Ultimate Classic Carrying Case - Black 6	
ACC0528	Ultimate Classic Carrying Case - Navy 6	
Vt		-

Kensington

ACC0497	Custom Track Balls-Red12.
ACC0511	Keyboard Shelf for Compact Macs 39.
ACC0410	Keyboard Slideaway42.
ACC0618	LaserStand 129. SE Anti-Glare Filter 52.
ACC0459	SE Anti-Glare Filter
ACC0243	MasterPiece MacII
ACC0257	Power Tree 50 54.
ACC0097	System Saver Mac - Platinum 63.
	Products
ACC0055	Fanny Mac QT55.
ACC0247 OCLI	SE Silencer39.
ACC0586	Glare/Guard Plus Portrait85.
ACC0585	Glare/Guard Plus 13" 85.
Sony	diditi/duditi Filas 15
MED0031	Disks - 1.44 Mb High Density (3.5) 24.
MED0003	Disks - DS/DD (box of 10)
Targus,	
ACC0438	MacIlcx/ci Carrying Case (black)79.
ACC0252	MacPlus/SE Carrying Case (black) 65.
ACC0250	MacPlus/SE-Ext Keyboard Carrying Case 79.

(Microcom)

The Virex application program detects and repairs

Complete Undelete UTI0140 \$49.

Utilities Family

files infected by Macintosh viruses. The Virex 3 INIT repairs damaged files instantly before a virus can spread. **911 Utilities**, a collection of disk and file recovery tools, protects computer-based information from loss or damage so you'll never have to worry when your Mac goes down. Complete Undelete

maintains a "Delete Log" of files thrown in the trash and recovers them if they were accidentally thrown away. Citadel with Shredder, a security tool box, protects your computer from

Virex 3.0 UTI0093 \$59. 911 UTI0191 \$89. Citadel UTI0233 \$93.

PI	RSONAL FINANCE
	e Corporation
OFIN0088	CheckFree
	er Associates
FIN0044	ACC PAC Bedford Simply Accounting 1.1 139
Inman	
FIN0116	Business Plan Toolkit 99
FIN0013	Business Sense 1.4
Intuit	
FIN0130	Quicken 3.0
Meca	
@FIN0039	Andrew Tobias' Managing Your Money 4.0 99

computers. The enhanced 105-key layout includes Period/Comma lock capability, an interchangeable Caps Lock and Ctrl keys. Also, the connecting cable you need is offered at no extra charge. The keyboard is backed by a limited lifetime warranty and unlimited toll-free product support. Includes offer for Tempo II, a keyboard macro package from Affinity Microsystems a \$149.95 value FREE! INPO156 \$145.

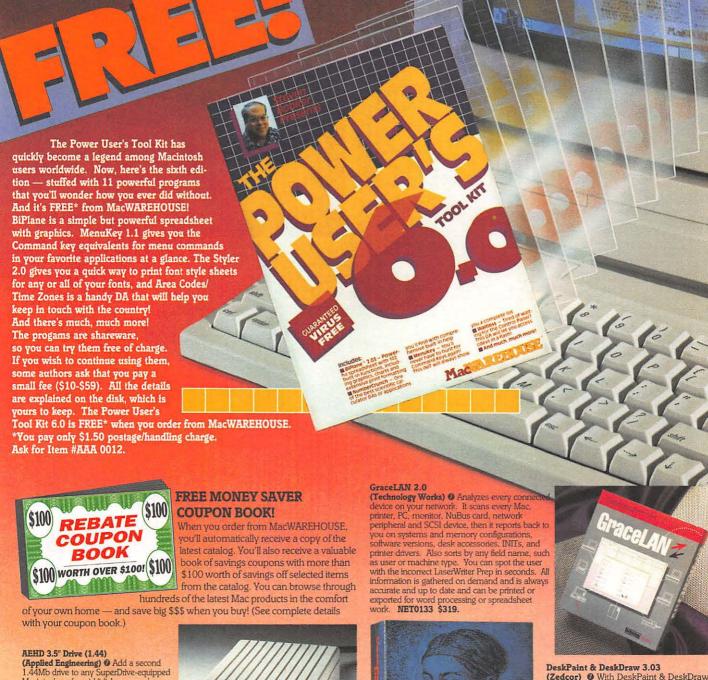
ACC0591 Premier Classic Mac Plus/SE Carrying Case69.

The "ULTIMATE" SE Carrying Case (I/O Design, Inc.)
The "ULTIMATE" SE Carrying Case is designed with the same high quality standards as other MacLuggage products. This case offers internal, padded compartments for ANY Macintosh keyboard, mouse, external hard disk and cables, also holds the new Macintosh Classic. It features two additional exterior pockets for everything from disks to umbrellas. Combine these features

Navv: ACC0440 \$85.







ABHD 3.5" Drive (1.44)

(Applied Engineering) & Add a second
1.44Mb drive to any SuperDrive-equipped
Macintosh and avoid "disk swapper's
elbow." Same performance, same color,
same features as Apple's FDHD SuperDrive
but at a much better price. The 3.5"
external high-density drive incorporates the
same high quality Sony mechanism Apple
uses and features auto-eject, MS-DOS
compatibility, exclusive two-color read/write
indicator light and a full one-year warranty.
DRIO287 \$245.

I'm Kerry, call me at

MacVAREHOUSE 1-800-255-6227

1-800-255-622 (1-800-ALL-MACS) Inquires: 908-367-0440

FAX: 908-905-9279
Call 24 hours a day, seven days a week.

NEW! Express Customer Service Number: 1-800-445-9677

*Midnight Express service available weekdays.



DeskPaint & DeskDraw 3.03 (Zedcor) © With DeskPaint & DeskDraw 3.03, you can create and edit graphics within any application. These DAs now edit black and white, gray scale and 32-bit color images, in multiple windows. They offer graduated fills, brightness and contrast controls, and an intelligent lasso and paint bucket. New DeskDraw has rulers, arrows, and multiple fonts, sizes and styles. GRA0199 \$113.

MWK1

FREE CATALOG SUBSCRIPTION

Free MacWAREHOUSE Catalog Subscription 1690 Oak Street, P.O. Box 3031, Lakewood, NJ 08701

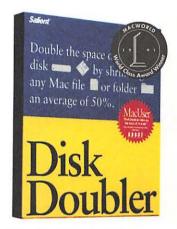
Please enter my free, one-year subscription to the MacWAREHOUSE catalog

Name
Address Apt.

City State (Expect to receive your first issue within 4-6 weeks).

ZIP

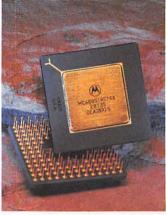
Avery De	ennison	
ACC0489	MacLabelPro	49.
ACC0589	1st Impression: The Desktop Bindery	299.
ACC0590	1st Impression First Pack	. 79
Raceline	Publishing	
O BUS0149	1 Shot Worksheet	56.
Casady	& Greene, Inc	
	QuickDex	36.
CE Softv	vare	
BUS0135	Alarming Events	85.
O GRA0070	CalendarMaker 3.0	31.
Claris		
ODAT006 4	FileMaker Pro	.215.
⊘ BUS0058	3 MacProject II 2.5	. 359.
OBUS0065	SmartForm Designer	. 289.
DeltaPoi	nt, Inc.	
@BUS0099	DeltaGraph 1.5	129.
Fisher Ic	lea Systems	
O BUS0168	3 IdeaFisher	.389.
⊘ BUS0169	Strategic Planning Module	65.
Fox Soft		
	FoxBase+/Mac 2.0	295.
Informix		
⊘ BUS0064	Wingz 1.1	245.
Kaetron		
BUS0100	TopDown 3.0	219.
Microso		
Ø BUS0167	7 Excel 3.0	309.
@BUS0008	PowerPoint 2.01	245.
@BUS0088	The Microsoft Office	Call
	Works 2.0	189.
On Tech	nology	
BUS0165	Meeting Maker 5-User	299.

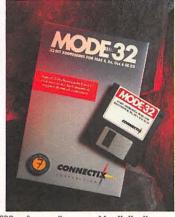


DiskDoubler 3.7 (Salient Software) Disk Doubler 3.7, the system 7 savvy

version, compresses your files when you version, complesses your lines when you save them and expands them when you open them. It doubles your hard disk and floppy disk storage capacity. Works transparently within any application, and operates in the background under MultiFinder. Disk Doubler works with documents, applications, plus sound graphics, and scanner files. UTI0179 \$49.

grapines,	and scanner mes. Click	J 445.
BUS0166	Meeting Maker 10-User	559.
	Systems	
@BUS0101	Dynodex - The Instant Address Book	72.
O DTP0055	DynoPage	72
Power U	D ,	
	Calendar Creator	
@BUS0121	FastForms 2.0	119
Round L	ake Publishing	
	Legal LetterWorks	
⊘ BOK0007	LetterWorks	59.
	Sales LetterWorks	59.
Satori		
@BUS0025	Bulk Mailer 3.2.5	75.
Shana C		
BUS0125	Informed Designer	159.
© BUS0162	Informed Manager	99.
Softview	(Full line available)	
BUS0138	if:X Forms Designer	169.
KENNIK TURK	if:X Expense Reports	ea. 49.
Symante	c Corporation	
	GreatWorks	
	More 3.0	265.
Synex		(3667
O BUS0120	MacEnvelope Plus 2.0 MacPhoneBook 3.0	185.
BUS0145	MacPhoneBook 3.0	32.
Timeslip	S	
	Timeslips III 2.0	195.
T/Maker	0	0.40
	SmartBundle	215
	Solutions	
BU50113	FastEnvelone	45





Connectix MODE32 (Connectix) MODE32 software allows any Mac II, IIx, IIcx or SE/30 to use standard System 7.0 32-bit addressing. Now these models can use up to 128 MB of RAM, and 1024 MB of Virtual Memory like the current machines. Make your dirty ROMs 32-bit clean, get MODE32. UTI0222 \$99.

MC73 PMMU

The MC73 PMMU chip lets your original Mac II use Sytem 7's standard Vitual Memory. Mac IIs lack the PMMU built into other machines, but have the socket for one. Includes detailed instructions and grounding strap. DRI0385 \$159.

NET0125 DaynaPort E/7

	4 FastLabel 3.0	45.
Zedcor	0 DECK 2 22	200
OR02011	8 DESK 3.03	209.
	CD-ROM	
EDUCO	RP	
CDR0010	Int'l, Graphics Library	. 229.
EDU0198	Lingua-ROM	. 399.
Microso		
BUS0119	The Microsoft Office CD-ROM	Call.
Quantur	n Leap	
CDR0024	GigiROM: Archival Library	109.
CDR0025	MacAdemic: Educational Library	79
CDR0026	CD7 SuperLibrary	49
Wayzata	Technology	
EDU0194	The World Fact Book	79.
CC	MMUNICATIONS 8	
CC	MIMONICATIONS	

NETWORKING Caravelle Networks Corporation

ONET0099 Mac to Mac - 5 pack	16
ONET0100 Mac to Mac - 10 pack	22
CE Software	
COM0054 In/Out (5 user Pak)	12
OCOM0041 QuickMail 2.2 (1 - 10 us	ers) 31:
CompuServe	
OCOM0085 Membership Kit For the	Macintosh 2
COM0040 Navigator 3.0	
DataViz	
OCOM0001 MacLink Plus / PC 5.0	12
OCOM0052 MacLink Plus / Translato	ors 5.0 10
Dayna Communications, Inc	
UTI0116 DOS Mounter 2.0	5

NE10125	DaynaPort E/Z	285.
	™ Computing	
COM0078	Liaison 3.0	279
NET0005	PhoneNET® 128/512	35.
NET0084	PhoneNET® Manager's Pack	669.
NET0007	PhoneNET® Plus, SE & II	
NET0040	PhoneNET® Plus, SE & II - 10 Pack .	198
NET0019	PhoneNET StarController®	. 899
NET0059	StarController™EN (EtherNet)	
NET0058	Timbuktu® 2.0 - Remote Access Paci	
O NET0122	Timbuktu® 4.0	
● NET0034	Timbuktu Remote® 2.0	135
	PhoneNFT® Card for EtherNet:	
NET0089	Nubus Mac II	299
NET0091	SE/30	299
NET0090	Nubus 10-pack	2499
FreeSoft		
⊘ COM0060	White Knight V.11	85.
Haves	5 NO 18 NO 1	
○ COM0018	5 Smartcom II 3.2	84.
Insignia		
Q UTI0174	AccessPC	65
● COM0063	3 Soft PC AT/EGA Module	125.
© COM0045	5 SoftPC 1.3	245
⊘ COM009	1 SoftPC 2.0 for Mac Classic & LC	139.
	onal Business Software	
NET0129	DataClub Single	119
NET0097	DataClub - 3 Pack	269
NET0098	DataClub - 10 Pack	
Microcon	n	
● NET0131	Carbon Copy Mac 2.0 Single	59
	Carbon Copy Mac Unlimited	
Prodigy		
COM0056	Prodigy Starter Kit for the Mac	27.

All major credit cards accepted. No surcharge.

Your credit card will not be charged until your order is shipped.

If we must ship a partial order, we pay the freight on the remaining portion.

All U.S. shipments are insured at no extra charge.

C.O.D. orders accepted (add \$6.00 including shipping) — \$1,000 maximum.

Cash, money order, or cashier's check. Corporate purchase order accepted subject to credit approval.

All products are covered by a 120 day limited warranty.*
Sales Tax: CT residents add 8%, NJ residents add 7%, Ohlo residents add appropriate tax.

All orders add \$3.00 per order. We ship Airborne Express overnlight unless UPS Ground delivers overnight. (Some rural areas require an extra day.)

Orders placed by 12:00 MIDNIGHT (EST) (weekdays) for "in stock" items ship same day (barring system failure, etc.) for overnight delivery.

C.O.D. orders ship via UPS (Blue Label if you are more than 2 days from us via UPS Ground). Charge is \$6 including shipping.

Alaska, Hawaii, outside continental U.S., APO/FPO call 908-367-0440 for information.

*Defective software replaced immediately. Hardware replaced or repaired at our discretion, **We regret that we cannot be responsible for typographical errors."

I'm Kerry, call me at:

Inquiries: 908-367-0440 Fax # 908-905-9279 (NOTE NEW N.J. AREA CODE)

1690 Oak Street, P.O. Box 3031, Lakewood, NJ 08701

NEW EXPRESS CUSTOMER SERVICE NUMBER: 1-800-445-9677





PowerKey with Quickkeys Lite-PowerKey Remote Turns on your Macintosh and pe-

ripherals from the keyboard. Can be programmed with an on/off schedule, and four outlets provide power line protection. Remote option lets you turn on your system with a single phone call. Works with all ADB-equipped Macs. PowerKey ACC0535 \$64. PowerKey Remote ACC0619 \$35.



MYOR 20

OStreamlines your accounting, and delivers essential information on the status of your busi-ness. Create a sales invoice and MYOB adds the amount to Receivables, decrements the inventory, and generates the monthly customer statement. Integrating G/L, A/R, A/P, Inventory and card files. FIN0087 \$139.



DaynaPORT

MWK1

DaynaPORT Ethernet adapters allow users to connect all mod-els of Macintosh computers to any type of Ethernet cabling, including 10BASE-T. New Dayna PORT E/Z offers the easiest Ethernet connection for the Plus, Classic, SE and Portable. NET0125 \$285.



Publish Itl Easy with FILE IT! 2.1 All-in-one desktop publisher in-

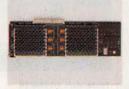
cludes: easy page layout, drawing and painting tools, rotate text in one-degree increments, slide-show feature, Quick-Start Mini-Manual. File It!, advanced built-in database and mail merge program lets you edit, search and sort files or custom-ized form letters without leaving Publish It! Easy. Eddy Award Winner. DTP0048 \$139.

FROM MacWareHouse



ClickAHT Events & Hollday Cartoons

ClickArt Events & Holiday Cartoons
Add fun and humor to your
upcoming holiday invitations,
announcements and publications! ClickArt Events and Holiday Cartoons is a collection of
100 imaginative images by
award winning cartoonist, Phil
Frank. The portfolio works
with virtually all page layout,
word processing and paint applications and can be colorized
with SuperPaint. GRA0270
\$32.



DayStar's RAM PowerCard

Daystar's KNM: rower-card

©Expand to 256 MB of true RAM

per card. Chain multiple cards together for even larger amounts of

RAM. Create a large RAM disk which

allows disk intensive work such as

photo retouching, database sorts, or

3-D renderings to fly! System 7's

virtual swap file can be stored in

RAM, providing real-time virtual

memory. DRI0416 \$779.



Bridge 6.0

Play a rubber of Bridge 6.0 with the Mac's three players. Bid with either the Stayman or Blackwood conventions. Bridge 6.0 handles all the book-keeping and tactfully informs you of any mistakes in bidding or play. It saves hands for later replaying and analysis. ENT0303 \$29.



QuickSCSI

OBoost the SCSI performance of your Mac and maintain real-time mirror image backups. Allows your hard drive to work at it's maximum speed as high as 4.4 MBytes per second. Other features include, Disk Mirroring, Disk Cloning, and multiple SCSI ports. DRI0406

Sitka		
NET0056	InBox Plus 3.0	1299
NET0057	DOSTOPS 3.0	
NET0049	MACTOPS 3.0	
Softwar	e Ventures	
⊘ COM00	94 Microphone II 4.0	215
Syngery	,	
⊘ COM00	03 Versa Term Pro 3.5	174
Techno	logy Works	
ONETO11	3 GraceLAN 2.0	319
DE	CUTOD DUDI IC	TTTRIC

DESKTOP PUBLISHING

	OTITOT I OPPROVE	
Aldus		
DTP0045	PageMaker 4.01	499
DTP0047	PrePrint	329
Letraset		
F0N0086	LetraStudio	275
Postcra	ft	
DTP0063	Layouts	85
Quark, I	nc.	
	QuarkStyle	
DTP0049	XPress 3.0	519
Silicon I		
DTP0040	Personal Press	199
TimeWo		
DTP0048	Publish It! Easy with File IT! 2.1	139
-	T DDTTTC C DOT	200

DTP0048	Publish It! Easy with File IT! 2.1	139.
DIS	K DRIVES & BOARI	S
Applied	Engineering	
ODRI0287	AE HD Mac Drive	245.
OINP0148	QuadraLink	209.
Comput	er Care	
ODRI0337	MacRescue Video	349.
ODRI0338	Video MacPac	349.
Comput	er Friends	
O GRA025	1 ColorSnap 32 Plus	649.
Dayna C	communications, Inc.	
DRI0174	DaynaFile dual 360K (5.25) & 1.44 (3	5)739.
IDS		
DRI0408	Pro 40 40 Meg Drive	349.

V-Series Ultra Smart Modem (Hayes) Bundled with Hayes award winning Smartcom II software. RS232 cables and HayesConnect network server software. Offers the best combination of connectivity and data throughput available in a high speed modem such as 100% error control using both the V.42 standard and MNP protocols and the option of wither 4 to 1 data compression with v.42bis or 2 to 1 with MNP5 error control. HayesConnect allows users to share modems or other serial devices such as plotters or printers across and AppleTalk network. MOD0065 \$829.



EDUCATIONAL & INSTRUCTIONAL

INSTRUCTIONAL
Technology, Inc.
HyperBible International Version 2.0 125
HyperBible King James Version 2.0 125
und
Kid Pix
The Playroom29



Accountant Inc.
(Softsync/BLOC) © "Accountant Inc. is the most complete intergrated accounting and financial management package for the Mac" says MacUser Magazine 3/91. Starting up with Accountant Inc. is quick and easy. Combines exceptional power with an elegant user interface to provide more flexibility and better reporting with less work. Unlike other packages, Accountant Inc. will grow as your business grows. Package includes Invoicing, Inventory, Receivables, Payables, Check Writing, Job Cost, Payroll, Integrated General Ledger and Financial Reporting. FIN0048 \$339.

DRI0409	Pro 80 80 Meg Drive
DRI0410	Clipper 20 20 Meg Drive
DRI0411	Clipper 40 40 Meg Drive
	Tashaslasu
DRI0218	Drive 1200
DRI0141	Drive 2.4
DRI0219	Drive 360 (5.25 in. floppy disk drive) 259.
DRI0140	Rapport
	croSystems
DRI0256	DataPak MO 512 MB
DINUZUO	Read-write/optical
GRA0243	QuickImage 24 Video Frame Grabber 595.
DRI0253	DataPak
DRI0254	DataPak II
DRI0234	DataPak Duet 1499
DRI0354	DataPak 88
	echnology
ADDIO107	Xceed 8-bit Video Card NB6-48
ODDINGSE	Xceed Ilci - 128 Cache Card
	ch International, Inc.
DRI0294	Athena A100 100 Meg Drive
DRI0294	Athena A50 50 Meg Drive599.
DRI0293	Europa 100 Meg Drive599.
DRI0308	Europa 20 Meg Drive
DRI0309	Europa 40 Meg Drive
DRI0309 DRI0307	MicroTech R50 50 Meg Removable 999.
DRI0307	Nova N50 Meg Drive565.
	Access International
Optical A	
	Access CD
ODRI0252	Access MF2995.
OWED0036	ACCESS MF
	Rewritable Optical Cartridge 250.
	al Land, Inc.
O DRI0375	
ODRI0193	Infinity Dual 40Mb Removable
ODRIO115	Infinity Turbo 40 Meg Removable
O DRI0154	Turbo Floppy 1.4 Drive
O DRI0406	QuickSCSI 479.

Davidso	n & Associates	
FDII0118	Math Blaster Mystery	29
OFDU017	9 French Tense Tutor	39
@FDU018	3 French Word Torture	35
@EDUO18	9 Learn To Speak French	69
	al Software	00.
@EDUIDOS	7 Typing Instructor Encore	19
OEDU000	3 Training for PageMaker 4.0	30
OEDUOZO	3 Training for Microsoft Word	42
	Company	76.
EDITION84	Math Rabbit	35
@EDITION4	8 Reader Rabbit 2.2	35
MECCN	larketing	00.
DENTO38	1 The Oregon Trail	20
OFDI IN19	0 Number Munchers	29
	1 Word Munchers	
Microlyt		20.
EDU0217		68
EDU0242		
MicroMa		00.
GRA0229		95
GRA0228	MapArt EPS Format	95
	Software	50,
EDITOTALS	MacKids Preschool Pack	36
	Word Search Deluxe	
Penton	Overseas (Full line available)	, 00.
Penton	OVocabuLearn Level I or II: French, Ger	man
	Hebrew, Italian, Japanese, Russian or Sc	
	Hebrew, Harlan, Japanese, Hussian Gros	
Parennal T	raining Systems	ud. UJ.
r craolidi i	Macintosh, HyperCard, FileMaker P	ro
	Microsoft Excel, Microsoft Word, Aldu	
	PageMaker 4.0. Aldus FreeHand, Aldu	
	Parenseion Augrk YPrace 2.0	

Persuasion, Quark XPress 3.0 ea. 52. Converting to System 7-part 1 52.

Converting to System 7-part 2

EDIJ0277



Queue		
EDU0109	Computer SAT Prep	57.
Visionar	ry Software	
EDU0207	LifeGuard	49.
EDU0209		
Voice &		
	Getting Started Video: Excel 2.2, PageM	laker
- 1	4.0, Word 4.0ea	a. 55.
TO STATE OF	Advanced Techniques Video: Excel 2.2,	
	PageMaker 4.0, Word 4.0ea	
EDU0063	HyperCard Getting Started Video	
7	on Dublishing Hause	
⊘ BOK002	1 MacBible - King James Version	79.
⊘ BOK002	MacBible - New International Version	79.
1	ENTERTAINMENT	
Artworx		
⊘ ENT0303	3 Bridge 6.0	29.
Broderb	ound	
ENT0259	Shufflepuck Cafe	25.
	Where is Carmen Sandiego? ea	a. 29.
Bulls Ci	tv Software	
ENT0308	Moriarity's Revenge	35.
Bullseye		
	6 Fokker Triplane Flight Simulator 2.8	25.
●ENT026	1 P51 Mustang 2.8	35.
	Software, Inc.	
ENT0264	BlackJack Ace	27.
●ENT032	9 BlackJack Strategy Tester w/ BlackJack Ar	ce65.

MacDraft 2.1

Electronic Arts

Canis Casino Master

CrapsMaster

Puzzle Master

Earl Weaver Baseball .

40

45

27

ENTO384

ENT0277

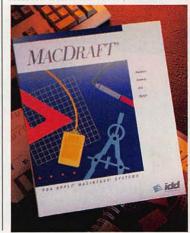
ENT0257

ENT0383

(Innovative Data) Provides the tools you need to create accurate drawings on your Mac. It supports PostScript output, has a removeable geometric drawing tool palette, multiple layers (limited only by available memory), on-line symbol libraries, 44 different scales, custom line styles, dimension lines, Bezier and spline curves, automatic area calculation, and smoothing of freehand shapes.

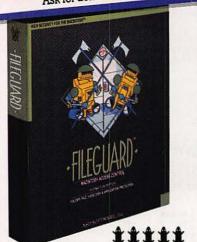
MacDraft supports 32-bit QuickDraw and custom fill patterns in both black and white and color. Reads TIFF and MacDraw II files. CAD0039 \$279.

Casino Master Deluxe Mac II Version



UARA

back guarantee, if you are not completely satisfied Ask for details when you place your order.



FileGuard 2.7 (ASD) © "It's Sleek, Fast, and safe. I highly recommend it": MacUser April 1991. Protect your Hard Drives and Partitions Protect your Hard Drives and Partitions from unauthorized access (including security bypass with a system diskette), copying and erasure: Applications and File/Folders (including system folder) from unauthorized access, deletion, and /or illegal copying; Desktop (including system folder) from alterations by unauthorized user; Keep an every on System Userd with the system user eye on System Usage with the system users log which continuously tracks user/group activity. System 7 compatible. Single: UTI0135 \$139.

Office 5 Pack: UTI0130 \$499.

Office 10 Pack: UTI0131 \$799.

@ENT035	5 Harpoon	39
ENT0382		
Sir Tech	Software, Inc.	
ENT0346	Bane of the Cosmic Forge	35
	Wizardry II: Knight of Diamonds	
Spectru	m HoloByte	
17.5 / S. S.	FACES, TETRIS, Welltris	ea. 25.
The Sof	tware Toolworks	
ENT0281	Chessmaster 2100	32.
ENT0269	The Hunt For Red October	20
Three-S	ixty	
ENT0323	Sands of Fire	32
XOR Co	rporation	
ENT0274	MacGolf Classic	52
FON	TS & APPPLICATI	ONS
Adobe S	Systems, Inc.	
	A Adoba Tuna Managar 2.0	En

FONTS	& APPPLICA	TIONS
Adobe Sys	tems, Inc.	
@F0N0264 Ad	lobe Type Manager 2.0	59.
@F0N0351 Ad	lobe Type On Call	NEW! 47.
0	Adobe Type Set 1 or 2	ea. 65.
@F0N0326 Ad	lobe Type Set 3	129
	Smart Art I, II, III or IV	
@DAC0028 Ad	lobe TypeAlign	65.
●F0N0295 Ad	lobe Type Reunion	45.
@F0N0434 Ac	lobe Type Set: Letters, Memi	os, Faxes 99.
●F0N0435 Ac	lobe Type Set: Invitations &	Awards 99.
● F0N0436 Ac	lobe Type Set: Overheads &	Slides 99.
@F0N0437 Ad	lobe Type Set: Spreedsheets	& Graphs 99.
Altsys	A SECTION OF PLANTS OF THE PROPERTY OF THE PRO	
OUTIO224 EP	S Exchange	89

FON0014 Fontographer 3.3 FON0284 Metamorphosis Professional 2.0 ARES FON0361 FontMonger Broderbund	65.
ARES F0N0361 FontMonger Broderbund	65,
FON0361 FontMonger Broderbund	119,
Broderbund	119,
GRA0156 TypeStyler	45.
Dubl-Click	45.
FON0081 MenuFonts 3.0	
Pacific Data Products	-
INP0153 Pacific MacPage	529.
Postcraft	***
DTP0062 Effects Specialist	115.
QMS	
UTI0169 UltraScript	135.
Sonnet	
@FON0410 FontCard NTX	469.
TeleTypesetting	
@FON0343 T-Script 3.0	92.
OFON0357 T-Script Basic	55.
GRAPHICS & MULTIME	DIA
	DIA
3G Graphics	
• GRA0188 Images with Impact! Accents & Borders	
GRA0111 Images with Impact! Business 1	
OGRA0257 Images with Impact! People 1	95.
Abracadata	
CAD0032 Design Your Own Home-Architecture	
CAD0033 Design Your Own Home-Interiors	65.
Adobe Systems, Inc.	070
ODTP0054 Illustrator 3.0 (w/ ATM 2.0)	379.

	Software	
	Easy Color Paint 2.0	47.
	Software	
GRA0075	Canvas 2.1	189.
GRA0187	UltraPaint	125.
Dream M	laker	
@GRA0105	Cliptures Vol 1 Business Images	69.
@GRA0124	Cliptures Vol 2 Business Images	69.
OGRA0219	Cliptures Vol 3 Sports	69.
O GRA0101	MacGallery (Hypercard version)	27.
	MacGallery (MacPaint version)	
Electron	ic Arts	
@GRA0106	Studio/8 2.0	189.
	Studio/32	
	™ Computing	
GRA0221	MediaTracks™2.0	219
GRA0222	MediaTracks™ Multimedia Pack	369.
Graphso		
@CAD002	4 Blueprint 2.1	219.
@CAD003) MiniCAD+ 3.0	595
	ve Data Design	
	MacDraft 2.1	279
	Dreams 1.1	
Letraset		
O GRA0151	ColorStudio	599
	ImageStudio 1.5	
MacroMi		
@GRA0273	MacroMind Director 3.0	739.
O Metro	Image Base (Full line availa	ble)
O GRA0169	Newsletter Maker	85



Adobe Type Sets for Business (Adobe) © Create higher quality, more effective documents and presentations with new Adobe Type Sets for Business. Selected for specific needs and bundled with Adobe Type Manager software the 4 new packages contain typefaces especially chosen for business letters, memos and faxes, overheads and slides, spreadsheets and graphs, and invitations and awards. Each package also contains a 32 page guide including suggestions for effective usage. \$99 ea.

O GRA0125	Streamline 2.0	122.
@GRA0191	PhotoShop 2.0	559.
Aldus		
O GRA0264	Freehand 3.0	399.
Baseline	Publishing	
GRA0242	Color MacCHEESE	56.
GRA0239	Master Color	99.
GRA0238	Master Paint	73.
Bright St	ar Tech, Inc.	
	interFACE	249.
Claris		
OCAD0029	ClarisCAD 2.0	645.
O GRA0271	MacDraw Pro	289.
O GRA0117	MacPaint 2.0	89.

More After Dark

(Berkeley Systems) It's M.A.D.! It's More After Dark— Over 25 incredible new displays for After Dark, the Ultimate Screen Saver. Features contest winners Mowin' Man, Tunnel, GraphStat, and many beautiful new fish! Kittens, Art Museum, and Lunatic Fringe game module help save your screen from phosphor burnin. (Requires After Dark software). UTI0230 \$25.

After Dark 2.0

After Dark 2.0 displays over 35 screen savers including classics Flying Toasters and Fish! Includes sound, password protection, logo and message display. UTI0119

Buy both and save! UTI0231 \$45.

The UnMouse

(Microtouch) The UnMouse does everything a mouse can—only faster, easier, and in less space. To move the cursor, simply slide your finger over the glass surface. To make a selection merely press down. The UnMouse also serves as an extended keyboard. Tap the large red button and you have a Power Keypad with 16 keys instantly available to execute macros (60 in advanced mode). With its one million touch points the UnMouse also performs as a small graphics tablet. INPO084 \$169.



Microphone II 4.0

Oldeal for International telecom-

munications. Praised for its ease of use and advanced scripting language, Microphone II 4.0 now contains faster script execution, screen speed, file transfers and new interface design tools. Sup-ports ZMODEM transfer protocol and can operate moderns at any speed from 50 to 57,600 baud. COM0094 \$215.



ProModem 24/96MSR

Now with V.42bis/MNP-5 data compression/error correc-tion at no extra cost, for up to 9600 bps throughput. With 9600 bps send/receive fax ca-pability, Maxfax 3.0 fax soft-ware, MAcKNOWLEDGE communications software and cable. MOD0046 \$299.



Wingz 1.1

Place resizable graphics and text fields anywhere on the page, with full macro capabilities. HyperScript programming language makes custom applications easy to create and use. Its incredible 2D and 3D graphics (in color on the Mac II), will amaze and delight up. When the color of and delight you. Wingz provides over 20 different graph types, and you can rotate, elevate, and change the viewing perspective freely. BUS0064 \$245.







Thunder 7
(Baseline Publishing) Checks the spelling in any document. This handy Desk Accessory is always available, and always uses the same dictionary. Works interactively to warn you of misspellings as you type. SPI.0029 \$56.

Exposure Pro Takes a snapshot of whatever is on your screen in 8-24-or 32-bit color. Just hit the user-definable key combination, and it captures the screen image. Saves through the Clipboard or Scrapbook, or in Paint, PICT, PICT2, Startup Screen, or Resource formats. UTI0182 \$78.

ScreenShot Easily capture your screen images. Hit the user-definable key combination and this handy CDEV pops up a menu to specify whether you want to print or save it in one of several formats. Captures whole screens, windows, menus, or selected portions. **UTI0183 \$34.**

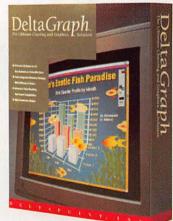


Tempo II Plus macros can dramatically simplify your work. Some examples: "Batch-process" hundreds of files with one command. Perform a dozen find/change operations as one step. Check disk space before starting a download, then wait for completion to log off and shut down. text, window names, etc., out loud. Play macros from a custom dialog box or a pull-down menu. In short, Tempo II Plus can perform practically any task you give it, instantly, accurately, and automatically. NEW-version 2.1 works with System 7, too! UTI0198 \$105.

MicroTouch ∂INP0084 169. Mouse Systems ∂INP0132 169. ØINP0132 Little Mouse ADB 75. ØINP0134 Trackball / ADB 69. Sophisticated Circuits 64. ACC0535 Power Key W/Quickeys Lite 64. ACC0619 Power Key Remote 35.			
Mouse Systems ØINP0132 Little Mouse ADB .75. ØINP0134 Tracktall / ADB .69. Sophisticated Circuits ACC0535 Power Key w/Quickeys Lite .64.	MicroTo	uch	
 ✓ INP0132 Little Mouse ADB	@INP0084	The UnMouse	169.
ØINP0134 Trackball / ADB	Mouse S	systems	
Sophisticated Circuits ACC0535 Power Key w/Quickeys Lite	@INP0132	Little Mouse ADB	.75.
ACC0535 Power Key w/Quickeys Lite64.	@INP0134	Trackball / ADB	. 69.
	Sophisti	cated Circuits	
ACC0619 Power Key Remote35.	ACC0535	Power Key w/Quickeys Lite	. 64.
	ACC0619	Power Key Remote	.35.

MEMORY UPGRADES & ACCELERATORS

Commect	A .	
ODRI0385	MC73	159.
OUT10222	MODE32	99.
UTI0144	Virtual 030 2.0 UM3	113.
DRI0185	Virtual 2.0 PMMU	188.
Daystar I	Digital	
DRI0224	64K FastCache Ilci	279.
DRI0288	40 MHz PowerCache (IIci)	959
ODRI0290	50 MHz PowerCache (IIci)	1699.
O DRI0416	RAM PowerCard	779.
Dove		
O DRI0130	MaraThon 030 (MacII)	599.
ODRI0198	MaraThon 030 (MacII)	399.
ODRI0197	MaraThon 030 - (MacPlus)	399.
ODRI0152	MaraThon 030X (MacIlx)	
O DRI0151	MaraThon 030-SE/030	599.
ODRI0380	MaraThon 030-SE/030 Marathon Racer For Mac II	1079.
O DRI0378	Marathon Racer For Mac Plus	599.
ODRI0379	Marathon Racer For Mac SE	
Impag		
CHP0043	512K Video SIMM Upgrade	149.





White Knight V.11

The perfect low-cost solution to almost any Mac User's telecommunication needs. Offers the kind of power associated with products costing hundreds of dollars more. Winner of 11 awards in-cluding MacWorld's World Class Software Award. COM0060 \$85.



NewsletterMaker Vol.1

Metro ImageBase Electronic Clip Art

O Communicate more effectively with fabulous art and graphics from the world's largest publisher of clip art. Each of the 18 ImageBase packages contains at least 100 topic-related images drawn by professional artists. **GRA0169 \$85**.



Word Search Deluxe

Perfect for newsletters, classrooms, and puzzle enthusiasts everywhere. Fun to create. Fun to play. Improve your vocabu-lary in any subject. Use as stand alone application to create, play and print word search puzzles or use in combination with word processing, paint and page layout programs for more decorative results. Supports color and digitized sounds. EDU0276 \$35.



PUZZLE MASTER

'MacWarehouse

Abaton @INP0157 Scan 300/Color INP0164 LaserScript Printer LX Applied Engineering 1759 @INP0148 Quadralink 209 Articulate Systems INP0160 Voice Voice Navigator II 559 RollerMouse ADB Curtis INP0141 MVP Mouse

INPUT & OUTPUT

Datadesk International

Mac101E Keyboard

(Centron) A new educational/ reference program for current and prospective dog owners. Includes VGA pictures of most popular breads, health care, and nutrition. ENT0384 \$27.

129

Puzzle Master

Solve crossword puzzles, or create your own. Includes 250 of The New York Times® classic puzzles, 200 daily puzzles and 50 Sunday puzzles. Built-in timer and scoring system allows you to test your skill against the experts. ENT0383 \$29.

Casino Master

Offers all the fun of playing the odds in Las Vegas without the risks. Simulates the five most popular casino games: Blackjack, Craps, Roulette, Poker, and Baccarat. ENT0277 \$40.



GRA0249 YIXBIR BUSINESS Image 32. GRA0279 ClickArt Business Image 32. GRA0272 ClickArt Color Graphics for Presentations99. GRA0088 ClickArt EPS Illustrations 82. School and Holidays 32. Zedcor OGRA0199 DeskPaint & DeskDraw 3.03 .

HARDWARE &

	PERIPHERALS	
Caere		
@INP0143	Typist 1.1	479.
CoStar		
@INP0091	LabelWriter	185.
Epson		
INP0167	Epson EPL-7500 Laser Printer	2599.
INP0173	Epson PostScript Kit	1599.
Seikosha		
INP0041	Seikosha SP 2000 AP Printer	235.
Sharp		
COMP007	Wizard OZ 7000 (32KRam)	229.
COMP018	Wizard OZ 7200 (64KRam)	255.
COMP019	Wizard Oz 8000 (64KRam)	329.
COMP023	Wizard Oz 8200 (128KRam)	399.
Thunder	Ware	
INP0116	LightningScan 400	385.
@INP0007	ThunderScan Plus	199.

Digital V	ision, Inc.	
GRA0145	Computer Eves B & W	199
@GRA0154	Computer Eyes For Mac-Color	349
ICD	Approximation of the second	
INP0095	Graflex	82
Kensing	ton	
INP0059	Turbo Mouse	109
INP0060	Turbo Mouse ADB (SE or II)	109
Key Tron	nic	
@INP0156	MacPro Plus	145
Koala		
INP0127	MacVision 3.0	269
Microspe	eed	
INP0126	MacTRAC ADB	75
INP0140	MacTRAC DB9	62
Microtek		
@INP0180	Microtek ScanMaker 600ZS	1699
	ScanMaker 1850S	
@INP0162	TrueLaser Printer	2019

DeltaGraph 1.5 (DeltaPoint) • Creates 25 types of charts and graphs. Use the Data Notebook to import data in a spreadsheet format, and DeltaGraph will create the chart you want. Embellish your graph by importing EPS or PICT files. Or, you can use the drawing tools, which include Bezier curves, fill patterns, and full color controls. Lets curves, fill patterns, and full color controls. Let-you print your graphs on either QuickDraw or PostScript printers, plus plotters and film recorders. It's the perfect solution for creating both business and scientific charts. **BUS0099** \$129.

Many of our products come with a thirty day money back guarantee, if you are not completely satisfied. Ask for details when you place your order.



Swivel 3D Professional (Paracomp)

O Create new product designs, illustrations, animation, and presentation graphics. Offers 24-bit color, eight light sources,

exports MacRenderMan, and full screen display for output to film and video. GRA0233 \$435.

micron i	echnology	
@DRI0321	PicturePress Card (Xceed ICDP-II)	745.
MicroTed	ch International, Inc.	
CHP0025	Mac Classic 1 Meg Upgrade	79.
CHP0026	Mac Classic 3 Meg Upgrade	
DRI0315	Mac Classic Upgrade Kit 20-1	399.
DRI0317	Mac Classic Upgrade Kit 40-1	
DRI0318	Mac Classic Upgrade Kit 40-3	575.
Newlife		
ODRI0419	Accelerator Classic 20MHz 68030	569.
@DRI0420	Accelerator Classic 20MHz 68030/68882	639.
@DRI0417	Accelerator SE/Plus 16 MHz 68030	379.
ODRI0418	Accelerator SE/Plus 16 MHz 68030/68882	539.
PowerUs	ser TM	
⊘ CHP0013	1 Meg Simm 100ns PowerUser	59.
Total Sys	stems	
O DRI0382		
ODRI0383	Enterprise ULC Upgrade Kit 20 MHz	265.
ODRI0384	Enterprise LC 20MHz 68030/68882	579.
ODRI0356	Enterprise LC 25MHz 68030/68882	899.
O DRI0357	Enterprise LC 33MHz 68030/6882	1135.
ODRI0295	Mercury 16MHz 68030 - Plus	499.
O DRI0297	Mercury 16MHz 68030 - SE	365.
@DRI0299	Mercury SCSI Module - Plus	209.
	Gemini & Gemini Classic (Full line ava	ilable)
⊘ DRI0301	Gemini 20 MHZ Card	819.
O DRI0302	Gemini 25 MHZ Card	1179.
O DRI0265	Gemini Plus Kit	129.
ODRI0360	Gemini Classic 20MHz 68030	979.

MODEMS & FAX

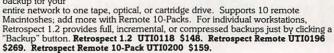
Abaton		
MOD0019	InterFax 12/48	259.
MOD0034	InterFax 24/96	339.
Applied	Engineering	
⊘ MOD005	4DataLink/Mac	209.
Best Dat	a	
MOD0021	SmartOne 2400/1200	139.
Dove		
⊘ MOD003	8 DoveFax Desktop	299.
	3 Dove Fax Plus	
Global V		
	9 TelePort 2400 ADB Modem	139
	8 TelePort/Fax 9600	
Hayes		
COM0023	Smartmodem 2400	349.
MOD0017	Smartmodem 9600 (V series)	589
MOD0060	Personal Modem 2400 w/Smartco	

MOD0065	Bundle V-Series Ultra SmartModem 9600 829.
Microco	m
MOD0050	MacModem V.32 / 9600689.
PowerU:	ser TM
M0D0043	2400 BPS Mini Modem 99.
MOD0047	Mini Send Fax 2400/9600
	24/96 Mini Send/Receive Fax Modem 199.

Retrospect 1.2 & Retrospect Remote (Dantz Development)

O Use your AppleTalk network for fast. automatic, unattended backup. At any time of the day or night your choice. Retrospect Remote goes from Macintosh to Macintosh and scans every hard disk

performing an incremental backup for your



Prometheus • MOD0052 9600M Plus Modern MOD0046 ProModem 24/96 MSR MOD0064 ProModem Ultima 299 699. ₱MOD0035 TravelModem Shiva ONET0067 NetModem V.32 (9600) ... 1169

Rapport, Drive 2.4, 360 & 1200

(Rennect Technology) Plug Kennect's New 5.25" Drives, Drive 1200 and Drive 360 into Rapport to read, write & initialize 1.2 MB or 360K MS DOS 7 Apple II 140K ProDOS. Drive



2.4 plugged into Rapport, is a 3.5" Diskette Drive which reads, write & initalizes all Mac & IBM formats expands 800K diskettes to 1.2 MB & High Density Diskettes to 2.4 Mb. Rapport alone enables older Macs to read 720K MS-DOS on the internal floppy drive or read & write 720K on an external Apple 800K Drive.

Rapport DRI0140 \$195. Drive 2.4 DRI0141 \$329. Drive 360 DRI0219 \$259. Drive 1200 DRI0218 \$259.

Gemini Classic (Total Systems)

O Attention Mac Classic users: Gemini Classic[™] can transform the way you work! 20-50MHz 68030 CPU has enough power to leave Ilci users choking in your dust! Races through large documents with full or dual-page display options. 4MB or 16MB total RAM for opening all your heavilyused applications together

See line listings for prices.

(supports 1 or 4 MB SIMMS). Virtual memory available, uses Classic's RAM as a RAM disk. Surface-mount circuits, robust mounting for maximum reliability, easily installed. A real Classic-booster at last!

Supra Corporation M0D0020 SupraModem 2400 **MUSIC & SOUND** Coda Music Software MUS0044Finale 2.6.1 549 **Electronic Arts** MUS0004 Deluxe Music Construction 2.5 . Farallon™ Computing
MUS0036 MacRecorder® 2.0 174 Opcode Systems MUS0083 MIDI Translator 43 Repertoire MUS0034 Music Publisher 2.5.



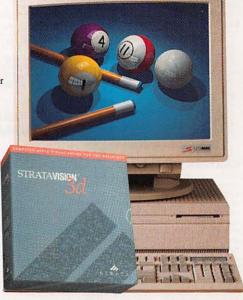
SECURITY & VIRUS PROTECTION

	-,	
ASD Sof	tware, Inc.	
O UTI0135	FileGuard 2.7	139.
O UTI0130	FileGuard 2.7 - Office Pack 5	499.
O UTI0131	FileGuard 2.7 - Office Pack 10	799
OACC0539	MaccessCard Reader	299
Fifth Ger	neration System	
	DiskLock	118
Kensing	ton	
	Apple Security Kit	34
	PassProof	ea 69.
Kent Mai	rsh	
O UTI0028	MacSafe II	107
O UTI0064	NightWatch 1.03	86
Microco	n	
O UTI0093	Virex 3.0	59
O UTI0150	Virex 10-pack	429.
	c Corporation	
	Symantec Antivirus for Mac 3.0 (SAM)	65
	The same of the sa	

UTILITIES & PROGRAMMING

	ystems, Inc.	
	Calc+	
O UTI0113	CanOpener	62
Advance	d Software	
OUTI0192	Intouch	39
Affinity		
OUTI0198	Tempo II Plus	105
Aladdin !		
UTI0145	Stufflt Deluxe 2.0	62
ALSoft		
O UTI0132	DiskExpress II 2.07	55
UTI0110	MasterJuggler 1.5	55
Baseline		
UTI0182	Exposure Pro	78
O UTI0187	INIT Manager	34
@UTI0190	Personality	
UTI0183	ScreenShot	34
Berkeley		
OUTI0119	After Dark 2.0	29
WIRESTS SELECT	The same of the sa	NAME OF TAXABLE PARTY.

StrataVISION 3d 2.0 (Strata) © StrataVISION 3d turns that vision in your mind's eye into a finished 3d rendering. You'll be able to create scenes with props, depth, shadows, extures, and reflections. You can adjust the three different types of lighting (directional, spotlight and point source), move the camera, and rotate objects to set up the perfect rendering of your concept. StrataVISION 3d takes full advantage of 32-bit Color QuickDraw. It prints on PostScript printers, film recorders, and video recorders. GRA0274 \$469.



CompaServe

You can now contact MacWAREHOUSE or place orders with us in the **Electronic Mall** on CompuServe. The **MacWAREHOUSE GO code** is **GO MW**. As always, you'll get fast, dependable overnight service and you can leave messages for Kerry or any of our support staff.

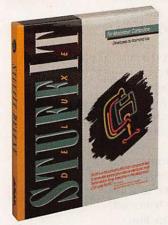
NewLife Accelerators (NewLife Computer Corp.)

Makes your Macintosh sizzle with a performance boost up to six

Accelerators, you not only get the computing power to process large spreadsheets and complex graphics, but you can add the optional video adapter and a larger monitor to display them as well. See line listings for prices.



O UTI0230	More After Dark	25.
O UTI0231	More After Dark/ After Dark 2.0 Bundle	45.
	Stepping Out II 2.02	
CE Softv		
O UTI0188	Quickeys 2 v.2	97.
Connect	ix	
UTI0148	Hand-Off II 1.1.3	56.
Custom	Applications	
O UTI0136	Freedom of Press 3.0.1	255.
O UTI0185	Freedom of Press Light 3.0.1	55.
Dantz De	evelopment	
O UTI0118	Retrospect 1.2	148.
O UTI0196	Retrospect Remote	269.
O UTI0200	Retrospect Remote 10-Pack	159.
Dariana :	Software	
O UIT0218	MacSlueth	89.



Stuffit Deluxe 2.0 (Aladdin Systems) Stuffit Deluxe is faster, and offers new choices in compression methods. Containing optimizers for text and MacPaint files, Stuffit Deluxe also has the ability to create Self-Unstuffing files that you can send to others. It includes HyperCard XCMDs and DAs for compressing and expanding files from within applications, plus QuicKeys 2 and Microphone II extensions. UTIO145 \$62.

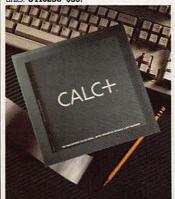
Dubl-Clic		
UTI0194	ClickChange	59.
	neration Systems	william Etc
Q UTI0063	FastBack II 2.5	125.
Q UTI0087	SuitCase II 1.2.1	49.
	evelopement	
	MacPrint 1.2	95
Kent Mai		
@UTI0212	FolderBolt	79
Magic Sc	ftware	
UT10077	Autosave II	26
Mainstay		
Q UTI0189	MacFlow 3.5	169
Microcor		
@11TI0233	Citadel	93
	911	
@HTI0140	Complete Undelete	49
Microsof	•	
LNG0030	QuickBASIC	64
Now Sof	tware	
O UTI0167		89.
	Screen Locker	45
ON Tech	nology	
UTI0142	ON Location	75
Salient	VII = 0.000	
	DiskDoubler 3.7	49
SNA		
UTI0207	Offline 2.0	65.

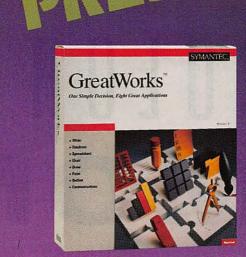
20		
SuperMa	C	
UTI0203	DiskFit 2.0	65.
	c Corporation	
UTI0151	Norton Utilities for the Mac	89.
UTI0078	Symantec Utilities for Mac II (SUM)	96.
⊘ LNG0051	THINK C 5.0	209.
LNG0002	THINK's Pascal 3.0	165.
Zedcor		
@LNG0031	ZBasic 5.0	99.

WORDPROCESSORS & SPELLING CHECKERS

Ashton-	Tate	
WRD0009	FullWrite Professional 1.1 S	PECIAL! 49.
Baseline		
@SPL0029	Thunder 7	56.
Caere		
	OmniDraft or OmniSpell	ea.69.
UTI0100	OmniPage 2.1	495.
Claris		
OWRD 00 2	26 MacWrite II	139.
DeltaPoi		
	8 TASTE/UltraPaint Bundle	79.
Deneba	Software	
	Spelling Coach Pro. 3.1	124.
Microso		
	2 Word 4.0	245.
	velopment	
	American Handbook of Business	
WRD0045	Instant Library of Quotations	32.
	English Writing Guide	39.
Paragon		0.45
	9Nisus 3.05	245.
Reference	ce Software	
	Grammatik Mac 2.0	
Sensible	Software Sensible Grammar	
		51.
SNA, Inc		
	Stylist	51.
T/Maker		110
	8WriteNow 2.2	119.
WordPer	1 WordPerfect 2.0	270
		279.
WordSta	Correct Grammar 2.0	E E
5rL0028	Correct Grammar 2.0	

(Abbott Systems) • A next generation calculator, with powerful decimal and Desktop Publishing function. It's fast, easy to use and has all the features of a professional desktop calculator multiline resizable display, paper tape, fast operation from the Mac's paper tape, tast operation from the Mat's numeric keypad or regular keyboard. It can also perform desktop publishing calculations in inches, centimeters, picas and ciceros and do instant conversions between ay of these units. UTI0236 \$39.





GreatWorks (Symantec) ② GreatWorks is a new software package for the Macintosh offering the functionality of eight feature incl. applications in a single, integrated program. Offers full word processing, database, spreadsheet, charting, drawing painting, outlining and communications modules. GreatWorks eight modules are modeled after popular stand alone applications so you get power you wouldn't expect to find in an integrated software program. GreatWorks is ready to handle any job, without compromising ease of use. BUS0176, \$209.



2400 BPS Mini Modem

Install a new Power User 2400 baud modern and log on to any of the exciting on-line services! This fully Hayes compatible modem comes with everything you need to start communicating. It's easy to install and ready to use. Comes with MACKNOWLEDGE communication software and the latest Maxfax software. Cable is included. MOD0043 Only \$99.

24/96 Mini Send/Receive Fax Modem

Includes all the features of the PowerUser 2400 BPS Mini Modern plus a powerful 9600bps send/receive fax to meet all your communication needs. Preview your fax on the screen, print it, delete it or forward it to another fax machine. Includes greyscaling to any Group III fax. All PowerUser modems come with a one year warranty. MOD0062 Just \$199.

I'm Donna, call me at



1-800-255-6227 Inquiries: 908-367-0440 FAX: 908-905-9279 ORDER TOLL-FREE

24 HOURS A DAY.

NEW! Express Customer Service Number: 1-800-445-9677

Despite marketing claims, color monitors are pretty much alike

CULUR MONITOR

MIRAGE

by Charles Seiter

Since the last time we reviewed 8-bit color monitor systems ("Color Monitors Put to the Test," *Macworld*, July 1990), video boards have dropped in price, a dozen vendors have introduced new big-screen monitors, and Apple, in its own often contrary fashion, has brought out a monitor that's *smaller* than anyone else's. Most items in this market are headed toward commodity status—you can buy generic 8-bit color boards from

one vendor to drive generic 19-inch monitors that are from another, for example. And while the Big Three Macintosh monitor vendors (Radius, RasterOps, and SuperMac Technology) are still leaders in terms of sales and development effort, they now face competition from nearly a dozen other companies.

Sources for monitors have also expanded. In addition to Sony, the dominant supplier of color monitors, Ikegami, Hitachi, Seiko, and Toshiba also sell monitors. This profusion of sources brings up at least one strategic question: Should you pay more than \$5000 at your friendly local dealer for a system from one of the Big Three vendors, or are you better off buying an under-\$3000 monitor from a vendor that sells direct or from a mail-order firm?

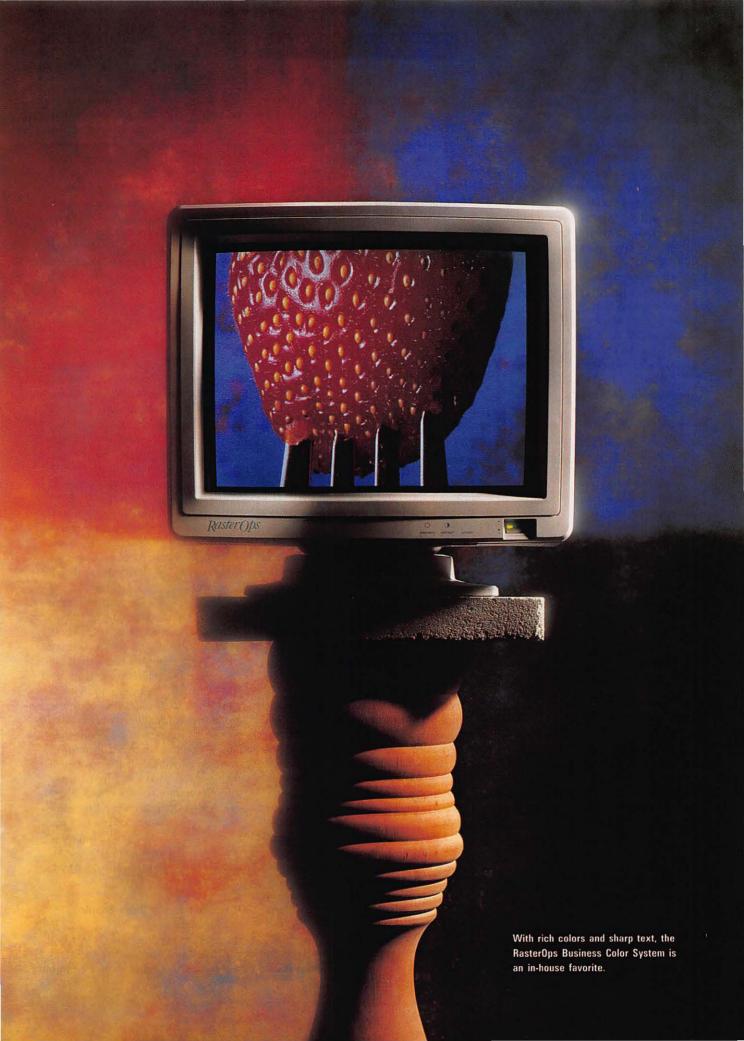
Two more basic questions you should consider before purchasing a color monitor system are: How much brightly lighted real estate do your eyes really need—can 16 or even 14 inches take care of you as well as a bigger monitor can? And do you need more than 8 bits of color? We'll look at these questions and others as we survey monitor options.

Spec Specifics

In order to fully understand the Macworld Lab test results, you need to review two mildly technical subjects: first, the way a color monitor puts a signal on the screen; second, how the Mac sends a signal through a video board to the monitor.

The traditional RGB (red-green-blue) cathode-ray tube (CRT) has three separate electron guns, which fire beams of electrons at sets of color phosphor dots on a monitor's screen, generating spots of light. On the way to the screen, the beams from the guns pass through a *shadow mask*—a metal plate with precisely spaced tiny holes. The shadow mask ensures that only nice thin beams hit the screen and that the beams strike only the correct phosphor dots. Since this precision can be upset if heat generated by the monitor expands the metal shadow mask even slightly, the best monitors (in this review set, those that use the Hitachi CRTs) use shadow masks of Invar, a special alloy with minimal thermal expansion.

Unlike the Hitachi CRT, the Trinitron CRT developed by Sony uses a single electron gun, a screen painted with narrow color-phosphor stripes, and a grid of fine vertical slots in place of a shadow mask. This design offers three potential advantages: it gives better vertical resolution than the traditional design does (see "Two Kinds of Screens: Close Up"); it lets more energy through to the phosphor, creating more screen brightness (the grid blocks the



COLOR MONITOR MIRAGE

electron beam less than a shadow mask does); and a single beam is easier to focus and align than three beams. These advantages have made the Trinitron CRT a consumer favorite. Of the 28 monitors we tested, 20 use Trinitron CRTs, and more than 85 percent of color Macintoshes in use today have Trinitron-based monitors.

Despite the differences, both types

of monitors must accurately throw an electron beam at very tiny dots on a screen that, in the case of large monitors, is more than a foot away. At these distances, the earth's 1-gauss magnetic field can produce slight misalignment of the final beam position. If the electron beams are knocked too far out of alignment, you see misconvergence-that is, the screen looks out-of-focus and you start to see fringes of color around black-and-

white text. For the sake of uniformity, whenever making convergence adjustments, monitor makers position the monitor to face east.

Measurable changes in convergence can occur when magnets are present (in nearby monitors, for example) or someone bumps into a monitor. Fortunately, some monitors-such as the Sony Trinitronshave easily accessible controls for adjusting convergence. These controls make monitors, especially big ones, more pleasant to use. Macworld Lab does not adjust convergence on monitors before taking objective readings. If you buy a monitor and are not happy with the convergence, you can adjust it yourself if the controls are accessible, or you can have the dealer adjust it for you.

Sending a Signal

The Mac is a digital device while the typical monitor is analog. How does

the Mac translate its set of numbers that characterize each pixel on a screen into a usable signal, like that for a color TV? The Mac sends a digital signal to a video display circuit, which is located either on its own main logic board (as in the LC, IIsi, and IIci) or on a display board. Three high-speed digital-to-analog converters then translate the signal into red,



For a good deal on a 19-inch Ikegami-based monitor system, check out the Mirror ProView/8 and the MacProducts MagicView.

green, and blue levels. Now the monitor is ready to produce any conceivable color—the 256-color limit implied by the designation 8-bit is due to a limit in the display circuit. The circuit allows you to save 256 index values—each value represents a particular combination of red, green, and blue levels. The set of possible combinations gives you access to more than 16 million colors, but the catch is that the 8-bit circuitry (which costs about one-third as much as 24-bit color) only lets you use 256 colors at one time.

For most applications, 256 colors is plenty. You need more if you want to view scanned images and expect them to look like color photographs. Some vendors, anticipating that you might eventually want this capability, offer trade-ins (E-Machines, Super-Mac, MegaGraphics) or upgrades (Radius, Sigma, RasterOps) from an 8-bit to a 24-bit board. The 8-bit ver-

sion of a scanned image looks slightly grainy compared to a 24-bit version, because the software is forced to pick a best fit from a set of colors that aren't an exact match—this means that boundaries can show the color equivalent of black-and-white jaggies.

In the 8-bit world, gamma-correction software can make colors seem more realistic. When you apply

> gamma correction to the monitor's palette of 256 colors, you fix in software the tracking (or electron-gun alignment) problems inherent in monitor design. For a given colorred, for examplethe value 0 in Apple's Color Picker software represents "all the way off" and 65,535 represents "as red as it gets." Each color in a monitor's palette is represented by three numbers-one for the strength of red, one for the strength of green,

and one for the strength of bluewhich are indexed into one overall number. Gamma-correction software takes into account the strength of the color guns at different signal levels, and adjusts the numbers so that the guns track together. This way the monitor can produce a smooth succession of gray levels at intermediate intensity values. In general, transformations that adjust all 256 colors in a set in a way that's mathematically smooth produce realistic colors. Short of invoking the precise but expensive calibration hardware designed for the RasterOps, Radius, and SuperMac units, using gamma-correction software is the only practical way to enhance color fidelity.

The Differences in Video Boards and Monitors

Having reviewed a bit of electrongun dynamics and color-generation theory, are you ready to pick a monitor from the Macworld Lab test data? Probably not, but in the course of doing cross-comparisons among groups of monitors, I discovered some principles that you should find useful. All you really need to know is this: the importance of video boards, the importance of CRT types, and how these components vary among vendors.

In general, I found that vendors are producing well-designed video boards to drive the monitors, thus making the board a small factor in your purchase decision. For instance, both the E-Machines T19 and the RasterOps 8L systems use Sony's 19-inch Trinitron, but each system uses a different video board. Compare the two systems, and you will find that since both companies have designed competent video boards, there isn't much variation in most of the objectively measurable parameters, and even less in subjective evaluation.

The differences are mainly due to variations in individual monitors. The difference in the monitors' distortion levels (differences that don't significantly affect user satisfaction) shows up as a slight bend in the menu bar at the top of the screen; this bend occurs in a small percentage of 19-inch Sony Trinitrons. Vendors who buy monitors from Sony claim that they present Sony with a unique set of specifications and rigorously screen all monitors they receive; there is simply no way to determine whether



For a smaller monitor, we place the Radius Color Pivot and the E-Machines ColorPage T16 at the top of our shopping list. Both show excellent quality and have a fair price.

Macworld Lab tests. The results are not unique to MegaGraphics products—in general, the 19-inch Sony Trinitron posts better scores than the 19-inch Ikegami.

Ikegami monitors, however, are generally cheaper than Sony monitors. Thus, the hard question to answer is If you can get an Ikegamibased monitor system such as the Mirror Technologies ProView/8 for \$2897 and take care of minor tracking deficiencies with software gamma correction, is it worth about \$1500 more to get a Sony-based system from another vendor? Judging subjectively between the two MegaGraphics products, Macworld found that the Sony unit shows clearer text, espe-

considerable length variations out at the 12-inch marks. How much variation occurs in a set of monitors from the same manufacturer (say Sony) using the same display board? Macworld Lab compared a set consisting of Ikegami monitors from Cutting Edge, Ehman, and MegaGraphics. The video boards shipped with these monitors are from the same source. Comparing these systems suggests the amount of variation you can expect in products the vendors try to make as identical as possible. The monitors show some differences in convergence and distortion, the most delicate variables in the objective evaluation, but strong similarities in tracking, contrast, and brightness. This means, among other things, that vendors can't accomplish much by prescreening the monitors they send Macworld Lab for evaluation. Translating these differences into a buying decision requires that you keep in mind that your vision may not be as acute as professional test equipment at registering small variations. Thus, if one monitor only edges out another in a test, you won't see any real-life differences in quality and should opt for the less expensive or better-supported product.

In 1989 you paid \$6000 for a good 19-inch monitor; now you can get one that meets the same specs for less than \$3000

or not this screening process allows a vendor to ship a higher percentage of "perfect" monitors.

We compared two monitor types driven by the same board—the MegaGraphics 19-inch Ikegami CT/20 and the MegaGraphics 19-inch Sony Trinitron, both driven by the MegaGraphics 2008 high-resolution video board. In every area except brightness, the Sony posts slightly better scores than the Ikegami in

cially if the user adjusts convergence with the two convenient knobs right up front on the monitor. If you typically work with text or with line drawings, the improved sharpness is worth the extra money.

What about Variation?

There's variation in every measurable quantity. If you buy ten cheap plastic 1-foot rulers and line up their 1-inch marks, you may be startled to find

Buyer's Guide

These observations lead to some general-purpose monitor-buying advice. First, visit the nearest dealer and try out the software you work with every day to see how much difference screen size makes to you. If a 14- or

COLOR MONITOR SYSTEM SPECIFICATIONS

Company	Name of Monitor	Name of Display Board	Price of Board	Price of Monitor	System Price	Picture Tube Manufacturer	Active Screen Area (h x w, in inches)	Diagonal Screer Size (in inches)
Apple Computer	Apple Macintosh 12" RGB Display	LC (internal)	included in Mac LC	\$599	\$599	Sony	8.1 × 6.1	12
Apple Computer	AppleColor High- Resolution RGB Monitor	Macintosh Display Card 4 • 8	\$648	\$999	\$1647	Sony	9.3 x 6.8	13
CalComp	DrawingCard 2-Page Display System	NA	NA	NA	\$5995	Hitachi	15.5 x 11.6	21
Cutting Edge	20" Trinitron 8-Bit Color Monitor	NA	NA NA	NA	\$4199	Ikegami	14.2 x 10.75	20
E-Machines	ColorPage T16	DoubleColor	\$495	\$2500	\$2995	Sony	8.75 x 11.6	16
E-Machines	E-Machines T19	T19/8	\$1295	\$4200	\$5495	Sony	13.6 x 10.75	19
E-Machines	E-Machines TX	TX/8	\$1295	\$2500	\$3795	Sony	9.28 x 11.75	16
Ehman	20" Trinitron 8-Bit Color Monitor	NA	NA	NA	\$2895	Ikegami	14.2 x 10.75	20
Generation	Designer/8	Designer/8	\$895	\$3695	\$4395	Ikegami	14.25 x 10.75	20
Systems	20" Color Display System							
MacProducts USA	MagicView	MagicView	\$499	\$2312	\$2811	Ikegami	14.25 x 10.75	20
MacProducts USA	MagicView	MagicView	\$279	\$619	\$878	Seiko	9.75 × 7.4	14
MegaGraphics	MegaGraphics 2008/16" Color Display System	2008 (hi-res)	\$1599	\$1996	\$3595	Sony	11.6 x 9.3	16
MegaGraphics	MegaGraphics 2008/16" Color Display System	2008	\$1599	\$1996	\$3595	Sony	11.1 x 8.8	16
MegaGraphics	MegaGraphics 2008/19" Display System	2008	\$1599	\$2199	\$3798	Ikegami	13.6 x 11	19
MegaGraphics	MegaGraphics 2008/19" Display System	2008	\$1599	\$4349	\$5948	Sony	13.6 x 11	19
Mirror Technologies	ProView/8	NA	NA	NA	\$2897	Ikegami	14.3 x 10.7	19
Nutmeg Systems	Nutmeg 19 Color System	NA	NA	NA	\$4899	Sony	14 x 11	19
PCPC	PCPC II 19" Display System	CGC/2	\$995	\$2595	\$3495	Ikegami	14.2 x 10.7	19
Radius	Radius Color Display	DirectColor/83	\$1795	\$4295	\$6090	Sony	14.3 x 10.8	19
Radius	Radius Color Display/21	DirectColor/83	\$1795	\$4495	\$6290	Hitachi	14.4 x 11.3	21
Radius	Color Pivot	Color Pivot Interface	\$795	\$1995	\$2790	Toshiba	7.8 x 10.65	15
RasterOps Corporation	Business Color System	ColorBoard 708+	NA	NA	\$36985	Hitachi	14.4 x 10.75	19
RasterOps Corporation	RasterOps 8LC System	ColorBoard 8LC	NA	NA	\$36985	Hitachi	14.3 x 10.6	19
RasterOps Corporation	RasterOps 8XLi System	ColorBoard 8XLi	NA	NA	\$67986	Sony	14.2 x 10.6	19
Sigma Designs	ColorMax 8/24 Display System	NA	NA	\$4295	\$6090	Sony	14.2 x 10.7	19
SuperMac Technology	16" Trinitron Display	Spectrum/8 Series III ⁷	\$999	\$2700	\$3699	Sony	11.75 × 8.7	16
SuperMac Technology	19" Dual Mode Trinitron Display	Spectrum/8 Series III ⁷	\$999	\$4200	\$5199	Sony	14.25 x 10.6	19
SuperMac Technology	19" SuperMatch Color Display	Spectrum/8 Series III ⁷	\$999	\$2800	\$3799	Hitachi	14.3 x 10.75	19
SuperMac Technology	21' SuperMatch Two- Page Color Display	Spectrum/8 si	\$999	\$4400	\$5399	Hitachi	15.15 x 11.2	21

^{• =} yes; \bigcirc = no. ¹ B = brightness; C = contrast; D = degauss; Hstat = horizontal static convergence; Vstat = vertical static convergence; Heart = horizontal centering; Vcent = vertical centering; RGB = RGB adjustment; Hsize = horizontal size; Vsize = vertical size; W = width of image area. ² C = screen capture; E = enlarged menus; G = gamma correction; P = pop-up menus; S = screen saver; T = tear-off menus.

E STORY	W. D. W.			TENED IN	NAME OF THE OWNER, OWNE	HOW I	STATE OF THE PARTY.
Resolution (w x h, in pixels)	Pixel Density (in dots per inch)	Vertical Refresh Rate (in Hz)	Weight (in pounds)	Front or Side Controls	Back Controls ¹	Software ²	Hardware Pan and Zoom
512 x 384	64	60	35	B, C	none	none	0
640 x 480	72	67	34	B, C	D, Hstat, Vstat	none	0
1152 x 870	72	75	82	B, C, D, Hsize, Vsize, W	RGB	G, application template	0
1024 x 768	72	75	87	B, C	RGB	none	0
832 x 624	72	66.9	60	C, Hstat, Vstat, Vcent	none	C, E, G, S	0
1024 x 808	75	71.3	86	C, Hstat, Vstat, Vcent	none	C, E, G, S	0
1024 x 880	85	72	60	C, Hstat, Vstat, Vcent	none	C, E, G, S	0
1024 x 768	72	78	87	B, C	RGB	none	0
1024 x 768	72	75	85	B, C	RGB	none	0
1024 x 768	72	75	85	B, C	RGB	none	0
640 × 480	72	67	33	B, C	Hsize, Vsize, Hcent, Vcent	none	0
1024 x 826	88	69	55	C, Hstat, Vstat, Vcent	none	none	0
832 x 656	75	69	55.	C, Hstat, Vstat, Vcent	none	none	0
1024 × 826	75	69	85	B, C	RGB	none	0
1024 x 826	75	69	80	C, Hstat, Vstat, Vcent none		none	0
1024 × 768	72	75	90	B, C, D, Hstat, Vstat, Hcent, Vcent, Vsize	RGB	C	0
1024 x 768	72	78	85	B, C, D	none	none	0
1024 x 768	72	75	85	B, C	RGB	none	0
1152 x 882	824	72	84	C, Hstat, Vstat, Vcent	none	C, E, S, T	0
1152 x 882	784	71	81	B, C, D, Hcent, Vcent, W	none	C, E, S, T	0
640 x 870	82	75	48	B, C	none	C, E, S, T	0
1024 x 768	72	75	62	B, C, D, Hcent, Vcent, W	none	none	•
1024 x 768	72	75	62	B, C, D, Hcent, Vcent, W	none	none	•
1024 x 768	72	75	86	C, Hstat, Vstat, Vcent	none	none	•
1024 x 768	72	79	85	C, Hstat, Vstat, Vcent	none	G	0
832 x 624	72	75	59.4	C, Hstat, Vstat, Vcent	none	none	
1024 × 768	72	75	97	none	none	none	
1024 x 768	72	75	85	B, C	none	none	• 1000000
1152 x 870	78	75	71	B, C, D	none	none	•

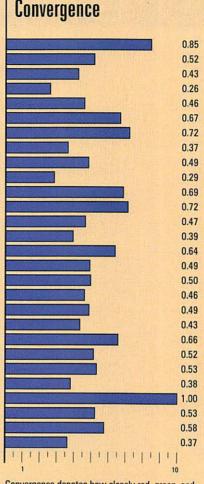
³ The DirectColor/8 can be upgraded to 24 bits. A nonupgradable 8-bit board, the PrecisionColor 8 is available for \$795. ⁴ A 72-dpi version of the DirectColor/8 is available for \$1895. ⁵ System with Sony monitor available for \$5198. ⁶ System with Hitachi monitor available for \$5298. ⁷ Can also use Spectrum/8 24 PDQ board (\$1399), which includes QuickDraw acceleration.

Color Monitor Tests

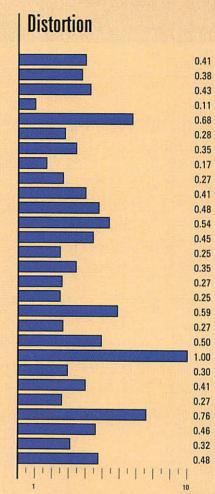
Longer bars are better



*This system is being replaced by the 8XLi.



Convergence denotes how closely red, green, and blue electrons meet on the same spot on a screen. The better a monitor's convergence, the more accurately the monitor renders color. The SuperMac 16" Trinitron Display had the best convergence and thus received an index rating of 1.00. On average, red, green, and blue were out of alignment by only .15 millimeters. The Cutting Edge 20" Trinitron had the worst convergence—its guns were out of alignment by .56 millimeters. We used a Klein convergence meter to measure convergence.



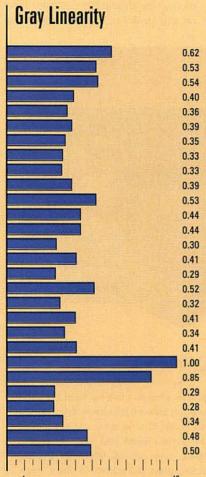
A monitor's level of distortion determines how geometrically correct an object appears on screen. None of the monitors had highly noticeable distortion. We measured (in units of 64ths of an inch) the total amount of distortion displayed in 9 squares at various locations on the screen and totaled the measurements. The RasterOps 8L System had the least distortion at 6.5 and thus received an index rating of 1.00. The Cutting Edge 20" Trinitron had the worst distortion at 6.5—nearly an inch total.

16-inch screen is sufficient, spare yourself the expense and physical nuisance of dealing with a giant two-page display. If you're upgrading from an SE or Classic to a color system, even 14 inches will seem expansive. Second, if absolute sharpness on very small text or fine lines is critical to

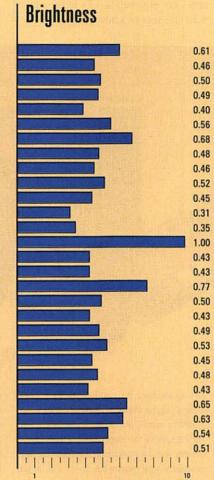
you, ask to see the actual monitor you will be buying demonstrated—different units, even those from the same vendor, have enough variation that in the most rigorous resolution tests some are just better than others.

Finally, quality-control standards on all these products are high enough

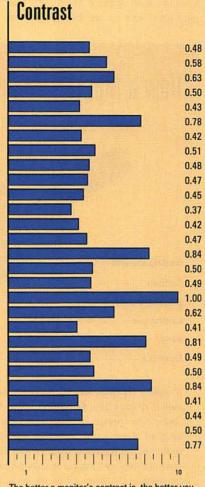
that none we tested was actually bad in any sense—a lower ranking here may mean that a monitor is very slightly less sharp or somewhat less bright, but every one of them was sharp enough and bright enough to be acceptable for day-to-day use. The chances of getting a lemon have been



Gray linearity indicates how accurate colors stay as they lose luminance. To test gray linearity, we used Apple's Color Picker to reduce the luminance of red, green, and blue in increments of 10 percent. We used a Minolta color analyzer to measure the luminance coming from the screen at each percentage drop. The RasterOps 8LC System had the best linearity and received an index rating of 1.00; the SuperMac 16" Trinitron Display had the worst linearity.



In our subjective tests, we found that most people prefer a brighter monitor. For our objective test, we turned the brightness up as high as it could go without showing scan lines on the monitor. We then used a Minolta luminance meter to measure brightness. The brightest monitor was the MegaGraphics 2008/19" Display (Ikegami) at 60.68 footlamberts—it received an index rating of 1.00. The dimmest monitor was the MegaGraphics 2008/16" Color Display (hi-res) at 19.11 footlamberts.



The better a monitor's contrast is, the better you can see details in light or dark areas of an image. To test contrast, we placed several white squares on a black background and then used a Minolta luminance meter to calculate the ratio between the luminance in each of the white squares and the luminance in the black background. We averaged the ratios. The Radius Color Display had the best contrast ratio at 16:1 and thus received an index rating of 1.00; the MegaGraphics 2008/16" Color Display had the worst contrast ratio at 6:1.

whittled to a very low level indeed by diligent engineers at Sony, Ikegami, and Hitachi. You may want to call customer support at a company a few times to see how fast your call gets answered, but if you're a hardy soul who doesn't need reassurance or dealer hand-holding for setup there's

no objective reason to pass up the savings you get by ordering a less expensive system from a price-competitive company or a mail-order firm.

A Colorful World

All the monitors we tested are of good quality, but we still have favor-

ites. Here are some picks in specific categories.

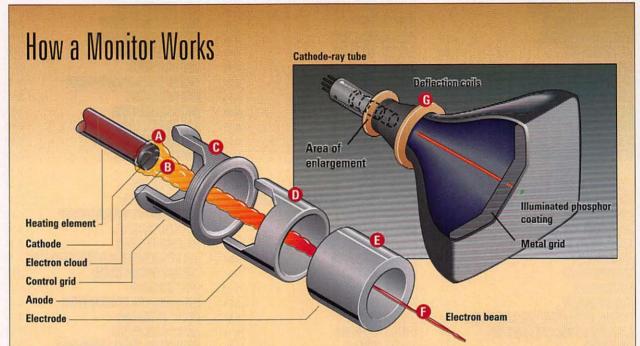
Small but Effective The 13-inch AppleColor High-Resolution RGB Monitor is still a quality monitor, but you can get an excellent bargain by purchasing a less expensive, 14-inch multisync monitor, a popular type of

COLOR MONITOR MIRAGE

monitor in the MS-DOS world (see "Sync or Swim—Low-Cost Monitors"). For instance, we tested the iDS ColorVue 14" Color Monitor from iDS Systems with Apple's Macintosh Display Card 4•8 to see how multisync

monitors fared. At \$399, the ColorVue is a great bargain. It has sharp text and bright colors. If you don't need more screen than this, get an iDS monitor and buy yourself a CD ROM player with the rest of your funds.

A Monitor with a Twist The Radius Color Pivot is an amazing device. If the Monitor Fairy wants to reward us for all our painstaking lab measurements, she should leave a Color Pivot on our desktop. The objective mea-

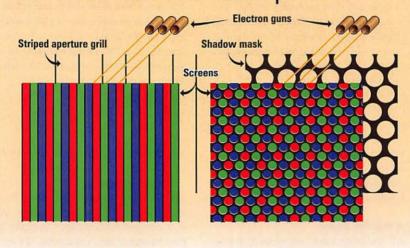


A cathode (A) starts the chain of events that leads to an image being displayed on a monitor's screen. When heated, the cathode produces a cloud of electrons (B). A control grid (C) determines the number of electrons that can pass—the more electrons that pass, the brighter the image on the screen will be. An anode (D) then accelerates the electrons, sending them

into an electrode (E) that focuses them into a beam (F) that is the same width as a pixel on the monitor's screen. All of these elements—from the cathode to the electrode—are housed in a monitor gun. A monochrome monitor has only one gun; a color monitor has three—one for red, one for blue, and one for green. Once the beams are focused in the guns, deflection coils (G)

generate a magnetic field that forces the beams to zig-zag back and forth across the screen at a rate of over 60 times per second (this is called the monitor's refresh rate). When the electron beams collide with the screen, the phosphor coating glows and produces a visible image.

Two Kinds of Screens: Close Up



All monitor screens have an internal phosphor coating backed by a fine metal grid. The grid determines how the monitor's screen appears on close inspection. The Sony Trinitron guns shoot red, green, and blue beams (left). A striped metal grid (called an aperture grill) separates the colors. Each gap in the grill is large enough to let a red, green, and blue beam pass. This setup gives Sony Trinitrons sharp resolution, but also—upon close inspection—noticeable vertical lines. Other monitors use a metal grid of staggered round holes (called a shadow mask). Each hole lets a red, green, and blue beam pass. The vertical resolution of these monitors is not as sharp, but you don't see any lines.

surements were not outstanding, and the screen does not really give you much more area than a 14-inch monitor, but the colors on the Pivot are particularly vivid, and the ability to change this monitor's orientation from landscape to portrait and back again makes the Color Pivot more flexible than a standard 14-inch monitor.

Sweet Sixteen We processed all the objective tests through SYSTAT 5.1, looking for correlations between quality factors. One result that emerged was that even Sony provides more-precise red-green-blue gun tracking on a 16-inch screen than on a 19-inch one. And the star among the Sony 16-inch monitors is the E-Machines ColorPage T16. If you work with line art or CAD drawings or just big spreadsheets with color highlights, the ColorPage T16 is the best monitor you can choose. All these monitors look good displaying color fish tanks; the ColorPage T16 looks good even when displaying green numbers in 9-point Times way off in the upper-right corner.

Big and Beautiful In the largest monitors, RasterOps has something for everyone: the Sony-based Raster-Ops 8L System won the greatest number of objective tests, and the Business Color System (a Hitachibased package listed for \$2500 less) was an in-house favorite for its richness of color and sharp text. Of the two monitors, we would opt for the Business Color System.

Real Deals If you need a big monitor and have budget constraints, you should go with the Mirror Pro-View/8 or the MacProducts Magic View. Within the specifications of Ikegami quality control, these systems are identical. The ProView/8 comes with some handy software utilities, although many similar utilities for large screens can be obtained as shareware. At the time this was written, these two firms were trading places as the "best buy" during a series of small price cuts; you should be able to get a 20-inch Ikegami-based 8-bit color system from one of these vendors or their competitors for around \$2500 before the end of the year. In objective tests, Ikegami monitors performed somewhat worse

SYNC OR SWIM—LOW-COST MONITORS

he lowest-cost color monitors for a given screen size are multisync systems. That's because these monitors, which can lock in on a range of vertical and horizontal scan rates, are produced in huge volume for the IBM PC market, where video boards follow a variety of standards. The iDS ColorVue 14" Color Monitor is one example; at \$399 it's the cheapest monitor we tested, but it performed well with the standard Macintosh Display Card 4.8 video board.

Most other vendors in the multisync market are large firms from Japan competing in the 14-inch market. Some representative examples are:

- Nissei Sangyo America's CM148M, at \$895, a monitor specially designed to conform to European standards for lower electromagnetic emissions;
- the Mitsubishi Diamond Scan 14, an \$839 monitor that can support up to 800 by 600 resolution;
- the Ultra 1400, at \$899 from Princeton Graphics Systems, is another lowpriced 14-inch system;
- the MultiSync 3D and 3DS, \$699 14-inch monitors from NEC Technologies that offer a 0.28mm dot pitch.

If you require color and are pressed for funds, you should know that every major monitor maker offers a multisync model that is compatible with the Macintosh II. Quality, particularly of text sharpness, varies from model to model. You should therefore examine a monitor demonstrated by a dealer before buying—the best multisyncs are very good indeed, but some simply are not as good as Apple's venerable Trinitron-based AppleColor High-Resolution RGB Monitor.

as a group than Sony monitors at convergence and tracking, and in subjective tests a bit worse than bigscreen Hitachi monitors in color richness. But you would be hard put to justify several thousand dollars' difference in price between these units and their competitors—looking at a discounted, mail-order Ikegami on your desk without other monitors around for detailed comparison, your opinion is going to be "Wow, what a great monitor!"

Reality Check

Bigger things cost more. Better bigger things cost more still. Apart from these observations, which were probably true for spear tips in the late Pleistocene, we can give you some new information. A vertical refresh rate over 65Hz means the screen doesn't flicker. It helps greatly to have horizontal and vertical static convergence knobs on the front of a monitor. Almost all the sources for 8-bit video boards seem equally competent. The quality control within given

manufacturers' lines appears tighter than it was two years ago, especially for larger monitors. The new wave of monitors from Ikegami and Hitachi will force down prices, even on Sony systems.

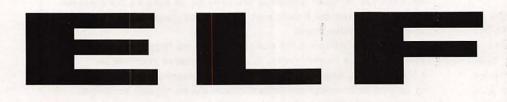
When *Macworld* reviewed color monitors in August 1989 you had to pay \$6000 for a good 19-inch monitor; now you can get one that meets the same specs for less than \$3000. You can, of course, save lots of money if you can live with a smaller screen, and it helps to look at several types of monitors close up before you buy. But 8-bit color monitors, at least, unlike software or networks or giant hard drives, have become an area in which it is hard to make a serious buying mistake.

See Where to Buy for contact information.

Macworld contributing editor
Charles Seiter works on problems in
color-image analysis and compression
for a San Francisco electronics firm.

SEEKING

Efforts to reduce extremelylow-frequency magnetic fields begin to pay off



RELIEF

by Rory J. O'Connor

To computer users who worry about the possible health dangers of exposure to the low-level magnetic fields emanating from their monitors, the issue seems clear: manufacturers should get rid of the offending emissions.

But monitor makers see shades of gray when it comes to emissions. Most say that they want to address public concern over the possible dangers of extremely-low-fre-

quency (ELF) magnetic emissions. Indeed, some see reducing emissions as a way for their product to stand out in a crowded and competitive marketplace—and as the only way to succeed in the booming European market, where consumers and labor unions may demand reduced-ELF products. Vendors complain, however, that because there is no scientific consensus on what level of magnetic emissions—if any—affects health in humans, they can't know just how far to go in reducing the emissions. "We don't know how low is low," says Stu Roberson, a product manager at Radius.

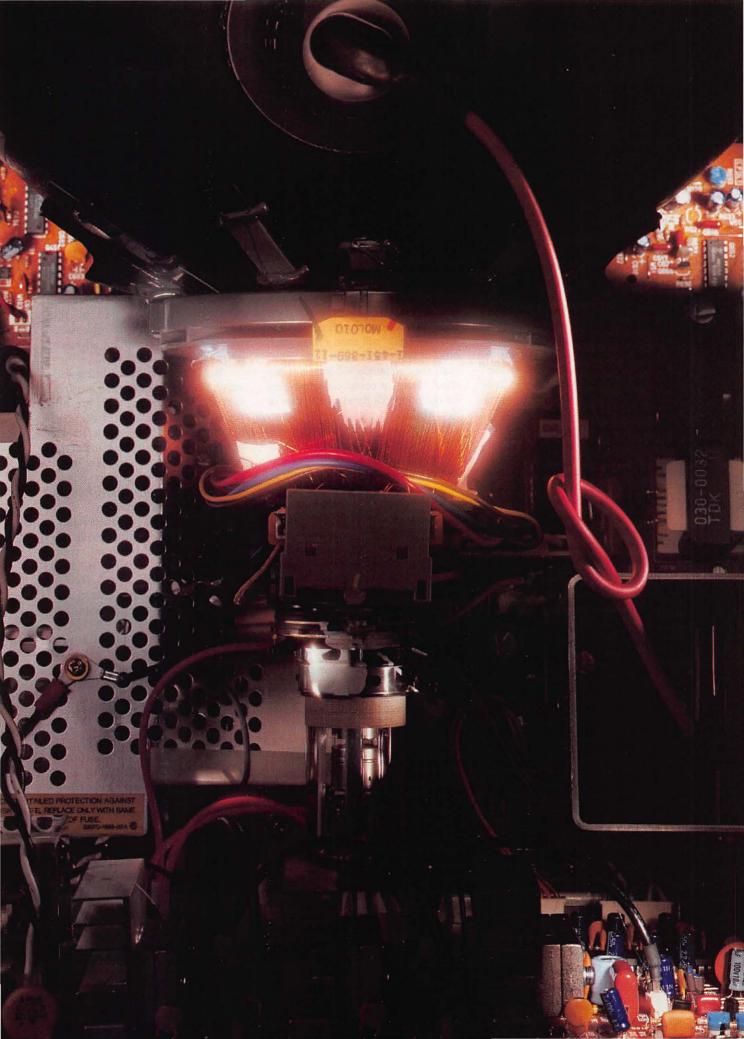
As long as monitors use cathode-ray tubes (CRTs), manufacturers can't easily eliminate all magnetic emissions—at least, not without making the devices far too costly. A CRT works by deflecting a beam of electrons with precise magnetic fields generated by wire coils wrapped like a yoke around the neck of the tube. Without sufficiently strong magnetic fields to move the electron beam, it would simply shoot straight ahead, never sweeping across the screen to draw the image you see.

Nonetheless, many leading monitor vendors are delivering, or say they are designing, new monitors with sharply reduced ELF magnetic emissions, using one or two well-understood techniques. Which engineering method is required, says Brian Berkeley, manager of display technology for Apple, "depends on the size of the screen and whether it is monochrome or color." Larger screens require higher current peaks to operate, and tend to generate more intense magnetic fields—thus requiring more stringent reduction techniques.

Coils Affect Emissions

ELF magnetic emissions can be reduced by changing the kind of wire coil used on the CRT yoke. Coils are often wound in a *saddle-toroidal* pattern, in which one coil surrounds a ferrite band that covers another central coil and directs the magnetic fields generated by the coils. Switching to a *saddle-saddle* method of winding the yoke coil—in which all the windings are inside a ferrite band—can reduce ELF emissions significantly, says Roberson (see "New Monitor Designs to Reduce Electromagnetic Emissions"). "On displays that have a saddle-saddle yoke, the ELF [emissions] are quite low," he says.

Macworld Lab tests of 32 color monitors confirmed that those with a saddle-saddle design uniformly emitted weaker ELF magnetic fields than monitors using a saddle-toroidal design (see "ELF Magnetic Emissions").



SEEKING ELF RELIEF

Monitors from several vendors showed dramatic improvements over monitors from the same companies tested by Macworld Lab last year. And in all but three cases (monitors with saddle-toroidal coils) emissions drop off to below 1 milligauss (1/1000 of a gauss, a unit of magnetic-field strength) at 28 inches from the front of the monitor. Users can reduce their exposure to ELF magnetic fields by simply staying this far away from the screen (and slightly farther from the sides and back of the monitor) whenever possible (see "The Magnetic-Field Menace," Macworld, July 1990).

Some monitor makers have avoided saddle-saddle coils out of concern that they don't deliver as crisp an image as the standard, saddle-toroidal coils, according to Carlo Infante, senior consulting engineer at Digital Equipment Corporation (DEC). But Infante calls the difference in image quality slight. In Macworld Lab tests, coil design was not a factor in image quality (see "Color Monitor Mirage," in this issue).

Gary Baker, display engineering manager at SuperMac Technology, says that the saddle-saddle design allows greater control over magnetic fields, actually improving consistency in image quality. Apple's Berkeley agrees that properly wound saddlesaddle coils can sharpen the image in the far corners of the big screen. But he adds that the saddle-saddle coils are more difficult for manufacturers to wind, increasing production costs.

Canceling-Coil Solution

Some vendors favor an alternative emissions-reduction approach, one that counteracts magnetic fields generated by the yoke coil. This method involves installing near the yoke another series of wire coils that generate a canceling magnetic field.

The theory is straightforward, says DEC's Infante. "You induce an equal and opposite field in the canceling coils." The laws of physics dictate that the two fields will then cancel each other. "There is absolutely no question; the technique works," says Michael Mason, a computer consultant for the nonprofit Fund for the City of New York.

SuperMac combined saddle-saddle and canceling-coil technologies for a new 19-inch color monitor (which should be shipping by the time this article appears) with impressive results. Macworld Lab tests on a prototype of that unit showed lower ELF magnetic emissions than with any other monitor tested (see "ELF Magnetic Emissions"). Super-Mac wound canceling coils directly around the saddle-saddle coils surrounding the widest part of the yoke.

MegaGraphics expects to use canceling coils to modify some of its older monitor designs, as well as some newer ones. "We're putting on a coil that looks like a wing in two places around the yoke," says Brian Girvin, director of engineering for MegaGraphics. The 4-inch-long wings are electrically connected to the yoke coil, and also require some changes to the deflection circuit board that controls the electron beam. Girvin claims that this design reduces the magnetic fields to "pretty far below" levels recommended in the influential MPR-2 guidelines issued by the Swedish National Board for Measurement and Testing, without adversely affecting image quality.

But Infante says that adding canceling coils to monitor designs is not easy. If the canceling coils are not placed precisely in the correct spot, the canceling fields they generate will not properly oppose the fields of the yoke coil. The result: magnetic emissions that are weaker at some points, but even stronger than those from an unmodified monitor at others.

"Some of these countervailing fields cancel the emissions at the operator's location, but [can] create larger fields at other points," says Louis Slesin, editor of *VDT News*, a newsletter specializing in electromagnetic emissions issues (for subscriptions, write to P.O. Box 1799, Grand Central Station, New York, NY 10163; or call 212/517-2802). The canceling coils must also be placed so that they reduce the magnetic field enough to meet the Swedish guidelines without adversely affecting the magnetic fields that push the electron beam around.

And like the saddle-saddle method, canceling coils are not cheap. MegaGraphics CEO Diane Scott estimates that adding canceling coils will increase the company's production costs per monitor on its monochrome Rival line by 10 to 15 percent (although the added expense may not affect retail pricing). For some manufacturers, adding canceling coils to older designs isn't worth it. "We looked at it, and it was an expensive aftermarket fix," says Roberson of Radius.

Smaller monitors, such as the one in the Macintosh Classic, do not re-

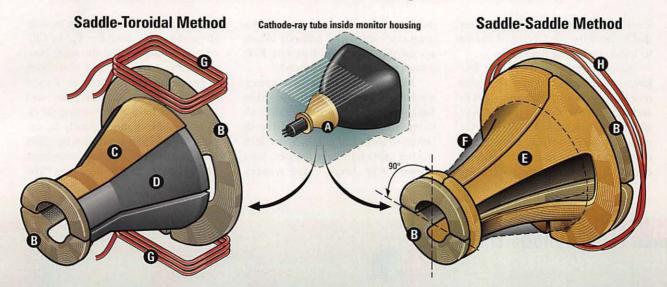
SHIELDING OLDER MODELS

s consumer concerns about CRT emissions have grown, so has the search for ways to shield the millions of monitors designed and sold before the potential hazards of ELF fields were widely known. Several companies market glare screens or shields that they say reduce ELF fields. E.L.F. Armor from Fairfield Engineering is one of the few that actually work. Macworld Lab verified that this steel-alloy cylinder, which fits over the CRT's yoke, reduces ELF magnetic emissions significantly (see *Conspicuous Consumer, Macworld,* February 1991). Some industry sources contend that this type of shield causes a buildup of heat that, over time, could damage monitor components. But no studies have confirmed those concerns. E.L.F. Armor costs \$79.95 for compact Macs and \$89.95 for 13-inch monitors.

Mag-Not, a \$49.95 product from TYV, consists of a pair of metal bands that fit on the outside of the monitor. In Macworld Lab tests, Mag-Not reduced ELF magnetic emissions between 17 and 69 percent, depending on the measuring points.

The best material for shielding is an alloy of 80 percent nickel, 15 percent iron, and 4.2 percent molybdenum. Called *mu metal*, the substance has been used for decades, primarily by the Department of Defense, to shield sensitive electronic components from stray magnetic fields. But mu metal is difficult and expensive to make, and it must not be reworked or dropped. At an estimated \$200 to \$300 per monitor, the heavy mu metal shields have not been widely adopted as a practical solution to ELF emissions.

New Monitor Designs to Reduce Electromagnetic Emissions



Variations in the design of monitor components significantly affect electromagnetic emissions. Images on a computer screen are created by an electron beam that sweeps from top to bottom and from left to right. That sweeping motion is controlled by magnetic fields generated by deflection coils within an assembly that looks like a yoke around the neck of the cathode-ray tube (A). Electromagnetic fields generated by the coils also emanate from the monitor.

There are two methods for winding deflection coils: saddle-saddle and saddle-toroidal. Both methods begin with an inner coil, shown in green (B), which controls the horizontal movement of the electron beam. In the saddle-toroidal method (left), a second coil, shown in gold (C), which controls the beam's vertical movement, is wound directly around a gray ferrite band (D) that encircles the central coil and helps concentrate the magnetic fields. In the saddle-

saddle method (right), the second coil, shown in gold (E), is placed on top of, and rotated at 90 degrees in relation to, the inner coil. A ferrite band (shown in a ghosted image at F) wraps over the middle section of the coil assembly. Macworld Lab tests indicated the saddle-saddle method to be clearly superior, showing lower ELF-magnetic emissions than the saddle-toroidal method.

To reduce electromagnetic emissions, some manufacturers are using or intend to use canceling coils whose electromagnetic fields operate in opposition to the fields of the main coils. MegaGraphics is working on canceling coils (shown in red at G), positioned above and below the main coils of its monitors that use the saddle-toroidal method. SuperMac has used a canceling coil (shown in red at H) that wraps around the largest section of the saddle-saddle coils. The SuperMac machine showed a lower level of ELF emissions than any other monitor tested.

quire a coil change, says Berkeley. Instead, a reduced-current saddle-toroidal yoke was developed for the Classic, and the Classic's various components partially cancel out one another's magnetic fields. (Macworld Lab tested the Classic and found that it emits relatively high levels of ELF magnetic emissions; but because the computer and the monitor are a single unit, and both components generate ELF emissions, the monitor alone could not be evaluated.)

Quality Control

While reduced-emissions monitors can certainly be produced, there is some doubt about whether they can be manufactured reliably, without significant variation from one unit or factory to the next. In one study, several identical models of an IBM monitor were found to vary in ELF emissions by as much as a factor of three, according to Slesin. Vendors agree they must impose stringent design and

THE EVOLVING SWEDISH GUIDELINES

he first Swedish guidelines governing electromagnetic emissions from CRTs, known as MPR-1, were released in 1986 and covered electrostatic emissions, x-radiation, and VLF magnetic emissions (defined as the frequencies between 2kHz and 400kHz, in cycles per second). In response to new research and concern voiced by consumers, workers, and labor unions, updated guidelines were released in 1990. The new guidelines, MPR-2, include added coverage of alternating electric fields and ELF magnetic fields. MPR-2 restricts ELF magnetic fields (5Hz to 2kHz) to an intensity of no more than 2.5mG at half a meter from the monitor. The Swedish National Board for Measurement and Testing, which established these guidelines, can be reached at 011 46 33-16 55 50 (phone) or 011 46 33-10 13 92 (fax).—Charles Piller

production standards to ensure that all units meet performance guidelines.

In the absence of U.S. standards, most monitor vendors look to the Swedish MPR-2 recommendations. While claiming that their products meet or improve upon the Swedish limits, monitor makers are reluctant to

release specific ELF figures to consumers. Radius and most other vendors want to treat the MPR-2 specifications much like an Underwriters Laboratories sticker—a statement to consumers that the product passed the test. Some companies pointedly say that without proof that a certain

SEEKING ELF RELIEF

level of emissions is harmful, they don't want a specific level of emissions to influence buying decisions.

Companies fear that with five kinds of emissions generated by every monitor—very-low-frequency (VLF) and ELF electric and magnetic fields, plus an electrostatic field—specific numbers will confuse consumers. (Some vendors add to consumer confusion, however, by advertising

products as having "reduced electromagnetic emissions," without clearly specifying that VLF, but not ELF, emissions have been reduced.)

ELF magnetic fields have generated more concern than the other fields because they are more difficult to control and have been more directly linked to biological effects in research studies. Although light fixtures, laser printers, hair dryers, coffee makers,

and even the electrical wiring in walls all produce ELF magnetic fields, CRT monitors have caused the most concern for two reasons: tens of millions of people sit directly in front of their monitors many hours every day; and researchers have linked biological effects in animals more closely to the pulsed waveform produced by CRTs than to the ELF magnetic waveform produced by other devices (see "The

ELF Magnetic Er			1									1	
10+ milligauss									1				~
5-<10 milligauss													
2-<5 milligauss		Cront			Dook			Loft			Dight		
0-<2 milligauss Coil winding mode	e*	Front			Back			Left			Right		
	1	4"	12"	28"	4"	12"	28"	4"	12"	28"	4"	12"	28
appleColor High Resolution RGB Monitor (S4)	ST	25.8	5.3		34.8	6.7		69.0	13.6	2.2	72.4	13.9	2.3
Apple Macintosh 12" RGB Display (M)	SS	7.8			6.0			16.1	3.1		17.1	3.1	
CalComp DrawingCard 2-Page Display (H3)	SS	3.4			7.2			9.3	2.2		9.0	2.2	
Cutting Edge 20" Trinitron 8-Bit Color Monitor (I)	SS	4.9			4.9			12.2	2.8		12.8	2.9	
-Machines ColorPage T16 (S1)	SS	8.1			8.7			19.3	3.7		8.8	2.5	
E-Machines T19 (S3)	SS	5.2			3.6			12.0	2.8		8.9	2.2	
E-Machines TX (S1)	SS	8.2			9.3	2.1		19.3	3.8		10.8	2.8	
Ehman 20" Trinitron 8-Bit Color Monitor (I)	SS	5.0			5.0			12.9	3.0		12.7	3.0	
Generation Systems Designer/8 20" Color (I)	SS	4.9			4.8			12.0	2.9		12.5	3.0	ļ
DS ColorVue 14" Color Monitor (G)	ST	29.9	6.7		48.8	8.9		93.4	18.4	2.8	100.9	18.9	2.
MacProducts USA MagicView (I)	SS	5.2			5.3			13.2	3.1		13.3	3.1	
MacProducts USA MagicView (SE)	ST	21.5	4.9		30.0	6.1		85.9	14.3	2.2	84.5	14.3	2.3
MegaGraphics MegaScreen 2008/16" Color (S1)	SS	8.2			9.8	2.1		20.1	4.0		11.3	2.8	
MegaGraphics 2008/19" Display System (I)	SS	5.3			5.6			13.6	3.3		13.8	3.3	
MegaGraphics 2008/19'Display System (S3)	SS	5.4			3.3			12.1	2.9		9.2	2.3	
Mirror Technologies ProView/8 (I)	SS	5.1			4.8			12.9	3.1		12.3	3.0	
NEC Multi-Sync 3D [†] (N)	ST	26.3	5.7		31.8	6.4		81.1	15.3	2.4	84.9	16.5	2.
PCPC II 19" Display System (I)	SS	4.9			5.1			12.5	3.0		12.3	3.0	
Radius Color Display (S3)	SS	5.4			3.4			12.4	2.9		9.2	2.3	
Radius Color Display/21 (H3)	SS	3.3			6.3			9.4	2.3		8.9	2.4	
Radius Color Pivot (landscape mode) (T)	SS	10.1			\$5.34			12.0	2.3		14.1	2.5	
Radius Color Pivot (portrait mode) (T)	SS	9,9			5.2			23.6	4.2		20.1	3.9	
RasterOps 8L System [‡] (S3)	SS	5.0			3.3			13.1	2.9		8.7	2.2	
RasterOps Business Color System (H1)	ST	15.2	4.5		32.6	6.8		54.8	13.5	2.3	57.8	13.4	2.
Sigma Designs ColorMax 8/24 Display (S3)	SS	5.2			3.6			11.8	2.8		9.1	2.3	1000
uperMac 16" Trinitron Display (S1)	SS	8.0			8.6	2.0		18.3	3.8		10.1	2.7	
SuperMac 19" Dual Mode Trinitron Display (S2)	SS	5.0			8.9			1.5.0	3.3		10.4	2.7	
SuperMac 19" SuperMatch Color Display (H4)	ST	15.2	4.4		34.0	7.0		58.4	13,4	2.4	57.3	13.6	2.
uperMac 21" SuperMatch Two-Page Color (H2)	SS	3.7			5.2			9.1	2.5		8.4	2.1	
Prototypes													
Apple 13" high-resolution prototype [] (S6)	SS	5.0			6.6			11.4	2.4		13.0	2.6	
Apple 21" high-resolution prototype# (F)	SS	5.0			3.8			10.8	2.9	Top Tall	10.3	2.5	
SuperMac 19" Dual Mode Trinitron prototype**(S5)	SS/CC	2.5		Section 19	4.1		Section 2019	6.7	STATE OF THE PERSON NAMED IN	THE REAL PROPERTY.	5.1		-

Manufacturer Key: F = FIMI (CRT supplied by another manufacturer, whose name Apple would not disclose); G = GoldStar 1450 Plus; H1 = Hitachi CM2086A3UX; H2 = Hitachi CM2186 A3UY; H3 = Hitachi HM-4320-D; H4 = Hitachi STD 9782 (SuperMac custom); I = Ikegami C/T-20H/A; M = Mitsubishi (Apple custom); N = NEC; S1 = Sony GDM-1602; S2 = Sony STD 9750 (SuperMac custom); S3 = Sony GDM-1950 (Trinitron); S4 = Sony M0401 (Apple custom); S5 = Sony STD 9751 (SuperMac custom); S6 = Sony (Trinitron); SE = Seiko CM 1445; T = Toshiba E8290B22.

*SS = Saddle/saddle; ST = saddle/toroidal; CC = canceling coils attached. ¹The Multi-Sync 4Ds model, which was not available at the time of our tests, reduces ELF emissions, according to NEC. [‡]This machine is gradually being phased out in favor of the 8XLi. [§]This measurement was taken at 4.5 inches due to position of cables. ¹¹Not being sold at press time, but should be available by the time this article appears. [#]Will not be sold in the United States, but should be available everywhere else by the time this article appears. ^{**}Not being sold at press time, but should be available by September 1991.

Magnetic-Field Menace," *Macworld*, July 1990, and *Conspicuous Consumer* in this issue).

Testing Procedures

The difficulty of accurately measuring ELF emissions makes numerical comparisons difficult, argues John Chubb, low-emission manager at Apple and a leading expert on electromagnetic emissions. If background *noise*, or

ambient emissions—ELF magnetic fields produced by electrical wiring, light fixtures, and the like—are too high, he notes, an accurate reading of monitor emissions can't be made. "A lot of people are using the [MPR-2 guidelines] document and [measuring] equipment without the proper training," says Chubb. Apple is building a special emissions-measurement room with low-voltage DC lighting

and specially routed electrical cables.

The Swedish guidelines—which require 48 separate measurements on each monitor—are too costly for manufacturers to employ, Chubb says. Apple favors a new set of guidelines being developed by the Institute of Electrical and Electronics Engineers (IEEE). The IEEE guidelines, says Chubb, will specify the same levels of ELF magnetic emissions as the MPR-2 guidelines but will require only half as many measurements.

Both the MPR-2 and IEEE guidelines recommend that testing points be made in a circular pattern around each monitor in three planes, corresponding to the top, middle, and bottom of the screen, with all measurements taken from a distance of half a meter (about 20 inches). These configurations are well suited to an automated testing process. Macworld Lab used 23 measurements, but at varying distances from the monitor, including 4 inches and 12 inches. These points were determined without regard to engineering for massproduction testing, but they reflect a realistic range of distances at which users are exposed to ELF fields.

The IEEE guidelines, like MPR-2, will not be legally binding. Without government-mandated standards, manufacturers must decide whether to reduce emissions in their entire product line (as Radius says it will do by the end of the year), thereby raising their expenses, or to offer some less-expensive, unmodified monitors to compete with companies whose products cost less.

"It's getting to be a vicious market," says MegaGraphics' Scott. Her company will continue to sell older, less-expensive monochrome designs that do not reduce ELF magnetic fields, along with its lower-emissions color and monochrome models. "I am not totally convinced there is a problem with the [emissions]. But I don't want to stay awake nights wondering if I'm causing anyone harm."

See Where to Buy for contact information.

Rory J. O'Connor is computing editor of the San Jose Mercury News in California.

			0				
Тор	TO)	Botton				
4"	12"	28"	12"	28"			
50.2	9.2		8.8				
26.4	2.7		2.3				
17.5	2.5						
9.9	2.0		20				
16.5	2.6		2.0				
12.0	2.0		2.1				
16.7	2.0		2.1				
9.9	2.0						
108.6	13.4		8.5				
11.2	2.2		0.5				
65.9	10.1		7.2				
15.2	2.5		2.1				
11.6	2.3	SHEET STREET	Division .				
11.2	2.0						
10.3	2.0						
67.0	9.8		8.3				
10.9	2.1						
11.8	2.1						
16.6	2.4						
21.8	4.2		3.8				
12.5	2.3						
10.3	2.1						
73.2	11.0		8.3				
10.9	2.0						
15.2	2.5		2.2				
13.2	2.4	13/6					
68,4	10.7		6.6				
6.6		100					
	TY BO		m -				
11.3							
15.0	2.7						
7.4	Service Co.		A PROPERTY.				

To determine the strength of ELF magnetic fields, Macworld Lab used the Combinova Magnetic Field Meter (MFM) 10. ELF emission levels normally are similar within a model line and across models that use the same CRT. But because the strength of magnetic fields may vary, even in those cases, these figures should be viewed as an indication of ELF emissions by like machines—not the final word.

All electrical appliances and wiring emit magnetic fields. The tests were conducted, therefore, in a room of the Macworld offices that had the lowest background ELF magnetic fields—varying between 0.41 and 0.56mG over the course of testing (this is a lower background reading than typically exists in office settings). We do not present specific numerical readings for ELF emissions below 2mG because current testing technology cannot reliably measure differences at levels below 2mG, given the background levels. Due to background emissions, results in the 2 to <5mG range are subject to a 10 percent error, results above 5mG are subject to a 5 percent error.

The strongest emissions were from the sides and top of the monitors—more than 100mG from the right and top of the iDS ColorVue 14" Color Monitor, the most extreme case. But for all monitors, emissions dropped to below 2mG at 28 inches from the front, back, top, and bottom. Every saddle-saddle monitor showed emissions below 2mG at 12 inches from the front.

We found that every monitor with a saddle-saddle coil configuration emitted weaker magnetic fields than every saddle-toroidal monitor. The one monitor that combined saddle-saddle and canceling-coil technologies, Super-Mac's 19" prototype, on the whole emitted significantly weaker fields than any other monitor tested.

Measurements were taken from 4, 12, 28 (arm's length), and 36 inches from the center of the front, back, left, right, top, and bottom of each monitor. (In most cases, monitor design prevented measurements at 4 inches from the bottom, so that measurement has been omitted.) Because emissions dropped to below 2mG at 36 inches from every position tested for every monitor, those measurements are not shown.

No one knows what level of ELF magnetic emissions, if any, is harmful to human health. But some studies have correlated cell mutation and cancer in humans with ELF magnetic fields at or below emission levels seen at 4 inches for every monitor tested.

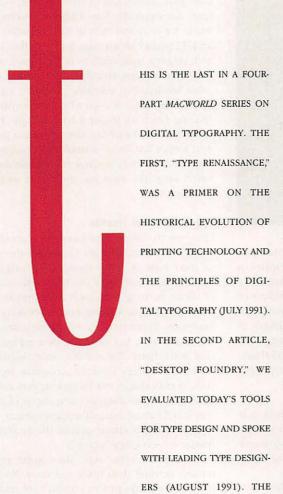


TYPE in Transition Part 4

HEID

TOP-NOTCH TYPE

The tools and techniques behind fine typography



Some of the most powerful typographic tools in existence are available on the Mac. But ask a professional typesetter about the Macintosh and desktop publishing, and you'll hear at least as much criticism as praise.

JIM

Having tools and knowing how to apply them are two different things. Fine saws don't make a fine cabinetmaker, nor can cutting-edge font technology make you a skilled typographer. Even professional designers are turning out substandard type that would never make it past the proofreaders at a fine type house. For that matter, most typographic flaws found in desktop publications are ones typesetters learn to avoid in their first week on the job.

What sets fine typography apart from ordinary typesetting is the extra care given to the appearance of every line. Beautiful type has an even color across the page: the spacing between characters, words, and lines is consistent and judiciously used—never too much, never too little. Lines end at logical stopping points, such as after commas and periods. The spacing of headlines and other large type is meticulously adjusted, each character coming within a hair's width of its neighbors.

Photograph by Geof Hern

THIRD, "POSTSCRIPT VERSUS

TRUETYPE," COMPARED TWO

KEY OUTLINE-FONT TECH-

NOLOGIES FROM A CON-

SUMER'S PERSPECTIVE (SEP-

TEMBER 1991).



To a fine typographer, every word, every line, and every paragraph is a design element unto itself. A typesetting house is the domain of specialists who adjust the spacing of characters and words with an interior decorator's eye.

But desktop publishing replaces the typographer with a Get Text or Place command. More and more, type is being set by designers and production artists who may lack a typographer's degree of training, or who don't have the hawk eyes of a proofreader, or who simply don't have the time or inclination to sweat the details that



Typographer Sandra
Tollefson at The
Type Gallery in
Seattle uses the
time-honored tools
of the trade to
make sure that type
is correctly spaced.

go into finely crafted type. "It's not reasonable to expect to find in one body a typographer, a designer, and a production person," says Betty Handly, a veteran typographer and president of Type Gallery, a Seattle-based type house. Kenneth Sahs, president of Shore Typographers in Chicago, agrees: "The bulk of our clients have good designers, good creatives, and good thinkers," he says, "but they don't have typographers."

Typography 101

The first dead giveaway of desktop publishing is bad punctuation style. Most people learn to type on typewriters, and unnecessarily bring those typographic restraints to the Macintosh (see "Punctuation Primer").

One of the most basic typographic decisions involves establishing the proper relationship between point size, *line length*, and *leading* (see "An Illustrated Glossary of Typography" for definitions of typographic terms; for definitions of character elements, see "Type Renaissance," *Macworld*, July 1991). When you read, your eyes establish a pattern of movement, recognizing groups of three or four words at a time. If too many words are on each line, the eyes tire more quickly and get distracted by adjacent lines. If too few words are on each line, the flow of the text is disrupted as the eyes are forced to jump

from right to left every few words. Short line lengths are especially troublesome with justified text, and lead to excessive hyphenation and wide spaces between words.

As with most things typographic, there is no cast-in-stone law of line length. But there are rules of thumb. One states that a line should be wide enough to accommodate two and a half lowercase alphabets in the desired type size and style. Another says you should strive for an average of 8 to 11 words per line. Both yield similar results.

As for leading, most publishing programs and word processors provide an autoleading option that adds 20 percent of the type size-10-point text, for example, has 12-point leading. That works for body text (text in sizes between 8-point and 12-point) in average line lengths, but not with display type, such as in headlines, and unusual line lengths. Headlines look better with no extra leading (for example, 18-point type with 18-point leading) or even with some negative line spacing (such as 16-point leading with 18-point type), provided one line doesn't touch the next. And longer line lengths need more leading than shorter ones. More leading in long line measures helps keep the eyes on track and away from adjacent lines.

Space: The Vital Frontier

One way to differentiate between a good typographer and a bad one is to compare the spacing of their type. A good typographer adjusts the spacing between pairs of characters—not only of classic *kerning* pairs such as *TA* and *Yo*, but of every pair whose spacing needs tweaking in certain sizes. Every typeface has these subtle kerning candidates, but only the best typographers deal with them. The result is more-legible type because the eyes tend to recognize words by their overall shape, not by picking out individual characters. (This phenomenon also explains why you should avoid using all-uppercase text, whose overall uniform shape makes the reader work harder to recognize words.)

Generally, larger type sizes need more extensive kerning than body text does. Early phototypesetting equipment couldn't set text larger than 18-point or 24-point, so typographers handset headlines using photographic equipment whose fonts were strips or disks of film. Some display type is still set this way, but thanks to digital output devices and their ability to set virtually any size, headlines are usually typeset along with body text, and most typographers electronically adjust headline spacing.

You can, too, by using a publishing program's manual-kerning features. Start by tightening up a headline's overall spacing using a *tracking* command, and then individually kern characters

PUNCTUATION PRIMER

as needed to obtain consistent spacing. But be forewarned: it's hard work. "To do good kerning across the board on a Mac is a time-consuming, tough job," says Shore Typographers' Kenneth Sahs. Print out tests after each tweaking session; the Mac's screen isn't accurate enough to display fine adjustments. For frequent headline work, consider a display-type program such as Letraset's LetraStudio or Brøderbund's Type-Styler, both of which electronically emulate the headline machines of yore and allow you to position individual characters by dragging them.

Regardless of your tools, follow the headline typographer's general rule: characters should be tight, but not touching. Remember to tighten up the space between words, too. And be consistent: if you tighten up a certain character pair in one headline, do it in all the headlines.

As for automatic kerning, TrueType and PostScript fonts contain kerning tables that specify common kerning pairs. Desktop publishing programs' automatic kerning features use a font's kerning table to determine how to kern those pairs. You can fine-tune the kerning tables to yield the most attractive results. If you send documents to a service bureau for imagesetting, you may need to supply a copy of the edited font too. (QuarkXPress users can supply the XPress Data file.)

Justified body text presents its own spacing challenges, especially in narrow columns. To justify text, or align it with both margins, a publishing program adjusts the space between words. The narrower the column, the greater the likelihood of distracting vertical rivers of white space. Rivers are undesirable areas of white space that appear to run vertically or diagonally through justified text. You can keep rivers at bay by telling the program to add space between letters, too, but only to a degree. Excessive letterspacing makes it more difficult to discern one word from the next, and that's at least as bad as wide word spacing. Because inconsistent spacing is an inherent part of justified text, many designers avoid justification in favor of a raggedright margin—a variable right margin.

But *rags* have their own requirements. You can simply let a publishing program determine line endings based on what will and won't fit, but when quality counts, you should take the helm and end some lines yourself by using the return key. For body text, you get a more attractive rag if the text tends to alternate between long lines and shorter ones. This gentle zigzagging of line endings emphasizes the uneven look of the ragged-right margin, and some say it reduces reader fatigue.

When you're looking for sensible places to break lines, look for pauses in the prose—commas, periods, dashes, and so on. The reader's Here is a quick summary of things you can do to make documents look more professionally typeset.

- Don't put two spaces after a period that ends a sentence; one will do.
- Don't use the straight-up-and-down typewriter quotes—those whose key is to the left of the return key. Use curly (or smart) quotes by pressing the open bracket ([) and close bracket (]) keys along with the shift and option keys in various finger-tangling combinations. If your word processor has a smart-quotes option, use it.

INCORRECT

"He said, 'You're kidding. A 36" goldfish?'"

CORRECT

Opening double quote: option-[

Opening single quote: option-1

Closing single quote and apostrophe: option-shift-]

He said, You're kidding.
A 36 goldfish?

Italicized typewriter marks to simulate prime marks Closing double quote: option-shift-[

- Position quotes properly relative to other punctuation. Commas and periods—and exclamation points and question marks when part of the quoted statement—go inside quotes; colons and semicolons belong outside.
- Don't use double hyphens to stand for a dash. Use an *em dash* (—) instead. An *en dash* (—) often represents the word *to* ("I work the 3–11 shift"), but don't use an en dash in a phrase containing *from* ("I worked from 3–11" is wrong). Don't substitute an en dash for the word *and* ("between 10–15 years old" is wrong).
- Don't use curly quotes or those heinous typewriter quotes for inch and foot symbols. The only true inch and foot symbols (technically, they're called prime marks) are in the Mac's Symbol font.
 If you don't feel like switching to Symbol for prime marks, you can simulate them by italicizing typewriter quotes.
- Hyphenate correctly. Don't rely on automatic hyphenation—it can't discern between pro-ject (the verb) and proj-ect (the noun). Avoid hyphenating more than three conseutive lines.

For a more complete guide to the commandments of typographic punctuation, see Robin Williams's *The Mac Is Not a Typewriter* (Peachpit Press, 1990).

mind pauses at these junctures, making them ideal places to end lines. Similar concepts apply to headlines. If you have a three-line headline, don't rely on a publishing program's word wrap feature to determine line breaks. Divide the headline into logical phrases, and break lines after each one. This is called breaking for sense.

Watch Your Weight: Small Capitals and Fractions

The Mac's ability to scale PostScript and True-Type fonts to virtually any size makes it easy to create *small caps* from a regular font—just choose a publishing program's small-caps option. Ditto for fractions—create small top and bottom characters, and sandwich a slash between them.

AN ILLUSTRATED GLOSSARY OF TYPOGRAPHY



The flavor of this favorite nut bread is enhanced by soaking the dates in boiling water and using the water in the batter. Loaves keep well if stored in airtight containers. For a variation, use pecans instead of walnuts.

INGREDIENTS

4½ cups brown sugar 2 TBSP. shortening 4½ TBSP. vanilla 4 eggs

4 cups flour

1 твяр. soda

I pound chopped dates

3 cups boiling water

2 cups chopped walnuts

PREPARATION

Preheat oven to 350. Mix brown sugar, shortening, vanilla, and eggs—beat well. Add flour and soda.

Soak dates in boiling water. Add flour and soda mixture to sugar mixture alternately with water from dates, using only enough water to produce a thick batter. Mix well. Add dates and nuts.

Pour in greased loaf pan and bake 60-70 minutes. Allow to cool for 10 minutes before removing from pan.

Makes 3 loaves.

Kerning Adjusting the space between a pair of characters such as *To* or *AW* for better appearance and legibility.

Tracking Uniformly adjusting letter and word spacing over a range of text. Also called track kerning, which generally means adding space between characters in very small sizes and decreasing space between characters and words in large sizes.

Baseline An imaginary line on which characters rest.

Display type Text in large sizes, usually above 14-point.

Swash An ornamental flourish on a character.

Dingbat A decorative character, sometimes called an ornament.

Drop cap A decorative capital letter at the beginning of a paragraph, set in a larger size than the surrounding body text and lowered to occupy more than one line.

Leading The amount of space between baselines. Pronounced *ledding*.

Letterspacing Adding space between letters to create an airy effect in a headline, justify body text, or improve the appearance of the text.

Old-style numerals Numerals with ascenders and descenders, often used in body type for better legibility.

Small caps Capital letters with the same x-height as the lowercase letters of a given font.

Gutter The vertical space between columns of text or between the inside margins of two facing pages.

Ligatures Two or more connected characters, such as fi or fl. **Em space** A fixed unit of space equal in width to the point size of the typeface you're using, often used for paragraph indents. **Hanging punctuation** Punctuation that is positioned outside the even left or right margin of text for better visual alignment. Also the technique of hanging quote symbols or other symbols over a period or comma to tighten up the text.

Em dash A dash, obtained by pressing shift-option-hyphen, equal in width to the point size of the typeface you're using. Body text Text in small sizes, usually between 8-point and

Rag An uneven left or, more often, right margin.

En dash A dash, obtained by pressing option-hyphen, equal to half the width of an em dash.

Line length The width of a column of type.

QuarkXPress even includes a feature that makes the fractions for you.

But is the quality of these elements up to the highest standards? No. The problem is subtle: when you enlarge or reduce characters, you change the width, or *weight*, of their stems, causing a mismatch with adjacent text. Thus, the stem weights of the small caps that publishing programs create don't match those of the large capitals they appear next to. In program-created fractions, the tiny numerals have such light stem weights that they often don't print well.

The answer? True-cut characters—characters specially designed to be used as small caps, fractions, and the like. More and more font developers are offering fonts containing small caps and fractions whose stem weights are designed to match the rest of the typeface. Several Adobe fonts, for example, have optional Expert Collections that include true-cut small caps, a variety of ready-made fractions, and separate numerals that were born to be numerators or denominators. Monotype offers similar ciphers under the Expert Set moniker. These collections often include other mainstays of fine typography, such as old-style numerals (those with descenders and ascenders) and ligatures (connected character pairs, such as fi and fl). They aren't cheap (Adobe's Expert Collections range from \$185 to \$275), but they're an essential part of a desktop typographer's toolbox.

If you commit to buying true-cut small caps, don't relegate them to headlines or special applications. Use them in body text where appropriate: for the chronological designations A.M., P.M., B.C., and A.D., and in other instances where large capitals would overwhelm surrounding lowercase text.

One more word about fractions: if you can't justify buying a fraction font, do create derived fractions instead of using full-size figures (as in 1-1/2). A derived fraction is better than no fraction at all.

Truth in Italics and Bolds

Another subtle point to be aware of is the difference between true *italic* text and *derived italics*, or *oblique*, text. In most typefaces, especially serif faces, italics are specially drawn to have their own scriptlike characteristics and to complement the stroke width of the upright, or roman, version (see "Type Renaissance," July 1991). The Mac, however, can electronically slant the roman version of a font to create a kind of pseudoitalic. To see an example, type some text in a font such as Geneva, Chicago, or New York, and then choose the italic style. Illustration programs such as Aldus FreeHand and Adobe Illustrator also let you create oblique text by slanting a block of roman text to an angle you specify.

HOW TO FIND SPECIAL CHARACTERS

To help them remember the keystrokes that summon accents, fractions, and other special characters, typesetters often refer to printed charts called keyboard layouts. For desktop typographers, the Macintosh provides an electronic keyboard layout—the Key Caps desk accessory, which displays an on-screen keyboard of the font you specify with a text-entry box above it.

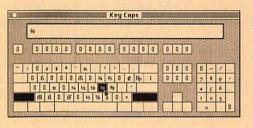
The Mao's special characters are accessed through combinations of the option and shift keys. When you press these keys, Key Caps updates its graphical keyboard to reflect the characters they summon. To locate a certain character in a given font, follow these steps.



 Choose the font's name from the Key Caps menu. This is an important step, since not all fonts provide the same characters in the same keyboard locations.

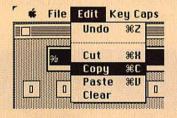
(Adobe's Caslon expert set is shown here.)

2. Press option with and without shift until you locate the character you want on the Key Caps



keyboard. When you find the desired character, continue holding down the option and/or the shift key(s), and then click on the character with the

mouse. It appears in the text-entry window above the keyboard. Repeat this step for any additional characters you need (such as those that would complete a fraction).



- Select the character(s) in the text-entry window and choose Copy or Cut from the Edit menu.
- 4. Return to the document, be sure to locate the blinking insertion point where you want the character to appear, and then choose Paste. If necessary, change the font to the desired typeface.

As an alternative to copying the character to the Clipboard, you can type the character directly by pressing the appropriate key combination and changing it to the desired font, as displayed by Key Caps.

Close the Key Caps window when you're done with it; leaving it open while you type in other programs slows the Mac as Key Caps keys flash merrily in the background.

Creating an accented character such as \acute{e} or $\~n$ requires a two-step key sequence. First, press the option key along with the character that calls up the accent. Next, type the character that will appear under the accent. For example, to create an n with a tilde over it $(\~n)$, press option-N and then type an n.





At Shore Typographers in Chicago, Mark Hnatow uses a phototypositor machine to handspace each letter in display type.

Oblique text can be a useful design element for headlines and other special purposes, but for body text you should generally use the font designer's true italics. In most cases, that's easy—simply install the italic versions of the typeface's screen and printer fonts. But some font packages don't include true italics. Adobe's ITC Benguiat package, for example, includes only roman and bold versions, even though Benguiat has beautiful italics. In this case, the solution is to buy the font package from Bitstream, which sells a complete version of the typeface.

The Bigger Picture

Clearly, setting top-notch type on the Macintosh requires a great deal of effort and skill, not to mention a watchful eye. Is the process as arduous on dedicated typesetting systems? Generally, the answer is no.

	PageMaker 4.0	QuarkXPress 3.0	DesignStudio 2.0
COMPANY	Aldus	Quark	Letraset USA
PRICE	\$795	\$795	\$795
TYPOGRAPHIC FEATURES			
Automatic kerning and tracking	•	•	•
Manual kerning/increments	●/.01 em	●/.005 em	●/.001 em
Editable kerning and tracking data	Only with third- party software	•	
Automatic drop caps	0	•	0
Hyphenation control	Very good *	Excellent	Excellent
Type rotatice angle	●/90-degree	●/any angle	•/any angle
Automatic fraction creation	0	•	•
Quote conversion as you type	0	0	•

yes; ○= no. * Can't specify minimum word length for hyphenation.

Most page-layout programs, from entry-level programs such as Timeworks' Publish-It Easy to long-document programs such as Frame Technology's FrameMaker, have some kerning and spacing-control features, but only these three programs provide the degree of control a fine typographer needs.

Dedicated systems have more extensive features for controlling spacing between words and letters. Although Mac page-layout programs allow you to manually kern with great precision, they don't provide on-screen codes that show just how much kerning you've applied between characters. With a dedicated system, if the typesetter wants to tighten a letter pair by two-thirds of a point, he or she can specify that amount, and a code reflecting it appears on the screen. This makes it easier to apply the same degree of kerning elsewhere. Hanging punctuation is also much easier on dedicated systems, thanks to their ability to zero-set characters-essentially to print one character (such as a quote) over another (such as a period or comma).

Dedicated systems are also better suited to producing lengthy, structured documents such as books and manuals. On a dedicated system, typesetters can create elaborate formatting macros that change margins, type styles, and sizes, and insert repetitive text with a single keystroke. The style-sheet features that Mac pagelayout programs offer don't go far enough in automating repetitive formatting tasks. Programs such as Interleaf Publisher and Frame Technology's FrameMaker provide better support for long documents, but their kerning and other character-finessing features don't match those of Aldus PageMaker, QuarkXPress, or Letraset's DesignStudio. The Mac makes you choose between quality and quantity.

And no typographer I know of would choose a Macintosh over a dedicated system for creating the elaborately formatted tables that appear in financial statements and annual reports. Adjusting column widths, straddling headings over columns, creating the rules that appear above totals and subtotals, and hanging parentheses into the *gutter* between columns are common chores in setting what veteran typesetters call tabular matter. The tab features in Mac publishing programs are adequate for simple tables but are taxed by complex ones.

The International Mac

The Mac does have a significant edge when it comes to combining text and graphics, of course, and it's the preferred platform for certain types of foreign-language work, particularly for Cyrillic, Arabic, kanji, and other non-Latin writing systems. Dedicated typesetting systems are designed for Western languages and their relatively simple, left-to-right, top-to-bottom text flow, and are stumped by languages such as Hebrew and Arabic, which operate by different rules, and ones such as Japanese and Chinese, which use thousands of characters.

The Mac isn't as parochial. A portion of its system software, the Script Manager, allows the

Mac to be easily adapted to other languages and script systems. Apple's KanjiTalk system is opening doors to new typographic and desktop publishing applications in Japan, and the company's forthcoming release of a Russian version of the Mac's system software was one of the hottest topics of discussion at a USSR developers' conference sponsored by *Macworld* and Apple last year.

But one of the many problems with supporting complex script systems involves accommodating the thousands of characters these languages require. The current standard for representing characters, ASCII (short for American Standard Code for Information Interchange), provides "slots" for just 256 characters—the maximum number that can be represented by one byte. ASCII is woefully inadequate for representing languages such as Japanese, Chinese, and Korean, and it complicates file exchange between systems that use various Western languages, since one language's computers may place accents and other characters at different positions than another language's computers.

The answer may be in a new character-encoding standard called Unicode, currently being developed by a consortium of major computer manufacturers and software houses. Unicode uses two bytes to represent characters, not one, allowing for up to 65,536 character positions—enough to represent every language in the world, along with a multitude of symbols and punctuation characters. Alas, the Unicode standard isn't finalized yet, nor has Apple announced when the Mac will support it. But TrueType and PostScript Level 2 can support multibyte character encoding schemes, so they're ready for Unicode when it arrives. "Font Futures" describes some additional type technology on the horizon.

In the meantime, most of us are more concerned with English-language text and the blood and guts of typography—putting words on paper and ensuring that they are spelled and hyphenated properly and spaced attractively. The techniques I've described here can help in that noble task. And even if you don't apply every one of them to your work, just knowing they exist is likely to give you a new respect for type—and for professional typographers, those meticulous directors of the most powerful cast of characters ever assembled.

See Where to Buy for contact information.

Contributing editor **Jim Heid** is a former typographer and former member of the International Typographers Union. He is the author of Macworld Complete Mac Handbook, an updated and expanded collection of his Getting Started columns.

1991 has been an important year for Macintosh typography. TrueType,
announced by Apple, and Multiple Master from
Adobe, promise to change the possibilities of
digital typography. The most remarkable features
have yet to be realized, and the most talked about
of these is nonlinear scaling.

When metal typefaces were cut by hand, each point size was designed independently, with subtle changes in the proportions and shapes of the letters.

The new digital type technologies promise a way to reproduce this attention to design detail through nonlinear scaling. With nonlinear scaling, the proportions of a character's outline change under various conditions. For example, in large point sizes, serifs may be more pronounced, or if the type reverses out of a dark background the letter may be scaled at a heavier weight. TrueType, and now PostScript—through its Multiple Master technology—promise such intelligent scaling in the near future.

But nonlinear scaling creates difficulties for typesetting applications, which have always relied on fixed and reliable character widths. These programs fit type into a line by counting the cumulative widths of the characters on that line—widths that are obtained by tables of character metrics located within the font itself. If type is to be scaled nonlinearly, though, character widths have to be calculated on a case-by-case basis, not just copied out of a standard width table.

The only way to make character-width calculations consistent across applications is to do it at the system level. This will be one of the jobs of Apple's Line Layout Manager, a system utility planned for a future release of system software (it isn't in System 7.0).

Another difficulty with nonlinear scaling is that it must be based on subjective visual criteria, not just precise mathematical formulas. How type in small sizes, small capitals, and condensed type should be correctly proportioned cannot be predicted algorithmically. For the best visual results, each typeface must be handled as a distinct case, and no one is yet willing to suggest just how that will be done.

Another capability dependent on the arrival of Line Layout Manager is character ductility—the ability to distort letter shapes to accommodate certain linguistic or typographic situations. This isn't a big issue in Western typography—except in some script and italic faces—but in Arabic, for instance, certain letters change shape according to the letters that appear around them. If those characters could change their shape contextually, keyboarding Arabic manuscripts would be greatly simplified. Similar situations exist in ideogrambased languages, such as Chinese. Again, Line Layout Manager is the key to making this prospective change practical.—James Felici







Reproducing the top W (Garamond) against a dark background results in a letter that looks thin with pronounced serifs, shown in the middle. The bottom W (Garamond Book) is easier to read against the dark background because it has wider diagonal strokes.

sive to incorporate.

New options mean better. moreaffordable four-color publishing

A diagram of the process most desktop publishers follow to produce color pages used to look like a complex board game complete with meandering detours to various vendors and dangerous squares with legends reading "Design change, go back to separator, pay \$1000" or "Stripping mistake, lose one day, miss deadline."

But the publishing game doesn't have to be played that way anymore. New techniques are enabling a growing number of publishers in businesses ranging from small design studios to Fortune magazine to straighten the crooked path that leads from design to four-color film. After years of inching toward the goal, these publishers are finally saving time, cutting costs, and even improving their products by building complete color mechanicals on the desktop.

Because these electronic documents incorporate all text and graphic elements on a pageincluding high-quality color photographs—they go directly from design to separation without pasteup or stripping. The process typically requires only one vendor. Highly accurate color mockups are a simple printout away at any point. And late changes are comparatively easy and inexpen-

Ask Me How

Two paths to complete color design are open to today's publishing pioneers. The high road involves translating Mac pages into a format that can be read by high-end prepress workstations (known in the trade as CEPS, or color electronic prepress systems). Once the files are on the CEPS stations, they can be merged with high-quality scans and output on high-end film plotters. This method marries the benefits of desktop design with a proven standard for color quality, but it isn't cheap.

The low road is more familiar to Mac publishers, relying as it does on PostScript imagesetters for output. What may be unfamiliar to many, however, is the quantum leap in quality that service bureaus using PostScript imagesetters have been able to achieve during the past year.

How good can imageset color get? All the photos and color elements in this article were placed in PageMaker and output on an Agfa SelectSet 5000 PostScript imagesetter.

Which of the paths to fully integrated color \{ \frac{1}{8}} publishing is right for you depends on factors such



as the type of publications you produce and how much extra work you're willing to take on. Before you start down one or the other road, you need to know a few things about how the two processes work, where you will and won't save money, and how the switch to full-page publishing will affect your production cycle. You will also want some information on how to get the best quality you can, whichever path you follow.

You Take the High Road

While software and hardware combinations that link Mac page-layout files to proprietary CEPS workstations have existed for several years, until this year they have mostly been adopted by larger and more sophisti-

cated Mac publishers, such as catalog houses and magazines. One reason is that the CEPS companies that created the linking systems have no experience marketing to end users, so few desktop publishers are aware of these prepress solutions.

These schemes for bringing Mac files into the proprietary formats imposed high costs and many restrictions. For example, Scitex America and Crosfield have both offered proprietary turnkey systems costing \$30,000 to \$50,000 depending on the hardware selected—a steep investment for a proprietary solution to a new, unsettled application area. And Crosfield's initial effort at an off-the-shelf link resulted in one that could accept files from just one of the three

then-popular page-layout programs. Predictably, the majority of desktop publishers were turned off by these approaches.

In response, CEPS vendors began shifting their focus to systems that could accept files from any standard Mac graphics or publishing program. The Du Pont Imaging StudioLink system was the first, late in 1988, followed closely by Scitex's VIP image processor. Hell's ScriptMaster system and Screen USA's OMEGA RIP processor both came out last year.

Initially, these products were a problem to use, for reasons that had as much to do with the culture of color-prepress service bureaus as with the technology. After years of either ignoring or maligning desktop publishing, CEPS operators suddenly found themselves working with desktop publishing documents filled with fonts and file formats about which they knew practically nothing. The links themselves tended to be slow, unable to process certain kinds of files, and rife with limitations that made them unacceptable to many publishers—an inability to accept Adobe's popular Type 1 fonts, for instance. Today, although prepresslinks systems are still nowhere near perfect, most of the shortcomings affect prepress operators more than they do publishers.

PREPRESS PRIMER

Prepress involves the same basic tasks whether done traditionally or electronically.

- For type and black-and-white line art, creating a negative.
- For noncolor photographs, creating halftone negatives (made up of dot patterns to simulate grays).
- For color elements, making four color separations (one film negative for each of the four standard printer's inks, called process colors).
- Making color proofs (also called match prints) so you can see how faithful the separated image is to the original
- Doing color correction on these separations to account for peculiarities in the printing press used or in the colors of the original image, as well as retouching to fine-tune the image.
- Trapping color elements that abut, such as a blue border around a red circle, so that the colors will print without gaps between them in case the printing press is slightly out of register. The interior element's outside border is printed slightly larger than actual size (spreading), and the exterior element's inside border is printed slightly larger than actual size (choking) so there is

enough overlap to prevent gaps.

- Creating silhouettes (also called masks), commonly used to isolate a subject from its background.
- Assembling all the pieces of film by stripping individual negatives onto the master negative, called a flat, which contains multiple pages and is sent to the printer when completed.

In the electronic approach, you no longer worry about multiple pieces of film, since the negatives are not created until you have merged all your elements in the layout and finalized it. This reduces errors and makes it easier to make changes and corrections.

Because electronic color prepress is relatively new, you may not
find one vendor with the expertise
or equipment to handle all the tasks.
Just as traditional publishers often
rely on one vendor for color separations and another for stripping,
many midrange desktop publishers
use one vendor for scanning and retouching and another for output.
With the growth in service bureaus
experienced in both electronic color
prepress and film output, however,
the one-stop shop is increasingly
easier to find.

CEPS Steps

The exact steps a publisher and CEPS operator take to produce a given page vary considerably, depending on the prepress-links system being used and the elements on the page. In fact, different shops with the same linking system may well follow very different routines. On a generic, idealized level, however, all the prepress-links systems subscribe to the same basic work-flow model.

All the linking systems start with the premise that most Macs lack the processing power to work with fullresolution versions of scanned photographs, which can easily run to tens of megabytes. So CEPS service bureaus make two set of scans: lowresolution scans for the designer to position during layout; and highresolution scans, which the service bureau substitutes into a layout before outputting the final film. The service bureau retains responsibility for color correction and any required retouching.

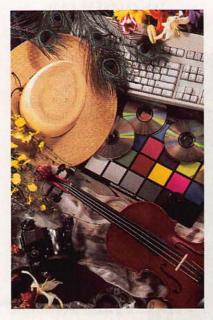
The designer positions the low-resolution scan on a page, crops it, and even—within limits—rotates and/or resizes it. (The limit for enlarging a scan is usually about 20 to 50 percent.) When it's time to output pages, the CEPS system's file-serving software recognizes the position scans by their file names, automatically swaps in their high-resolution cousins, and outputs the pages with the photographs in position and with scaling, sizing, and cropping instructions applied.

To understand prepress-link technology, it's important to know that film plotters can't interpret Post-Script. To print Mac pages on a film plotter, it's necessary first to run the file through a *RIP* (raster image processor), which translates PostScript's page descriptions to the proprietary language of the CEPS system.

This translation process can be a source of problems, but bringing Mac files into the domain of the proprietary CEPS workstations for retouching and stripping does have some clear advantages. Because proprietary formats describe a page in a less complex way than PostScript, even complicated pages print more quickly. Also, when you send files to the CEPS shop, it handles the job of trapping tint areas, color type, and PostScript illustrations—a difficult job given the limited capabilities of the Mac's trapping tools.

I'll Take the Low

From the end user's point of view, the low-road, PostScript-output path to Mac color pages isn't that different from the high-road method. The Post-Script service bureau makes two sets of scans, keeps the high-resolution versions, returns the low-resolution position scans, and then merges the full-scale scans into the final layout during output. The main difference between the two processes is that the PostScript service bureau uses a Post-Script imagesetter to output the pages; no translation is required from the layout program's PostScript files to another format.





To compare the results of the two color-prepress approaches, we sent high-resolution scans of the same photo to two service bureaus: a PostScript shop and a CEPS shop. The image at left was color-separated in Adobe Photoshop and output via an Agfa SelectSet 5000 PostScript imagesetter. The image at right was separated and output using a Scitex prepress system. In both cases, the service bureaus did standard color correction to match the original photograph's color balance. Neither did any retouching.

Until very recently the all-Post-Script path to color publishing was unacceptable for publications requiring high-quality output. Colors in photographs tended to be murky and inconsistent. Moiré patterns and the milder form of patterning called "prominent rosettes" cropped up regularly in both tints and photographic work. Imagesetters often got bogged down when outputting large or complex color files.

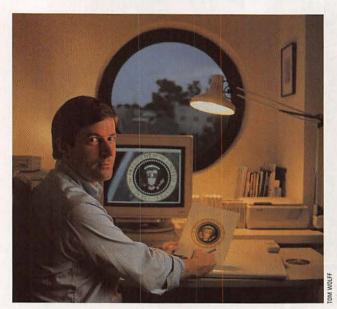
During the past year, three developments converged to dramatically improve PostScript color. One, the better PostScript service bureaus now use color scanners that are as good as high-end devices (in some cases they are high-end devices). Two, instead of printing color separations on what are essentially typesetting machines, PostScript services now have access to a new generation of faster, more precise imagesetters, as well as improved halftone-screening technologies (see "Hell's Angles"). Three, it's finally possible to find people running PostScript equipment who actually know something about color.

• Superior Scanning Without good input, good color is impossible. A \$10,000 Nikon slide scanner—previously the favorite of PostScript service bureaus—cannot compete with the \$70,000-plus machines serious shops are now buying. The premier

scanners in PostScript shops today are the Optronics ColorGetter, the Scitex Smart Scanner PS or SmarTwo PS, and Screen USA's SG-2010. These machines are similar to the input devices used in CEPS systems, but they have an interface that enables a Mac to drive them directly. Some PostScript service bureaus—mostly those that are outgrowths of traditional prepress shops—make scans on conventional CEPS scanners and transfer them to the Mac via add-on interfaces.

Because the scans come from high-end scanners, their quality is excellent. Midrange scanners like the Barneyscan CIS 4520, the Array SpeedScanner, and the Eikonix 1412 can also produce good results, but typically don't provide the same highlight and shadow detail as the more expensive devices, especially at larger sizes.

• Better Imagesetters The imagesetters setting the standard these days are the highly accurate drum-recorder models—the Agfa SelectSet 5000, the Optronics ColorSetter 2000, the Linotype-Hell Linotronic 630, the Scitex Dolev PS, and the Purup Prepress America ImageMaker 80/10. Also popular at serious color shops is the Linotronic 330, an upgrade to the standard L300. In the right hands, other imagesetters, like the Varityper 5330 and the Agfa 9800, can produce



Paul Grabhorn, who runs the Grabhorn Studio in Washington, D.C., combines strategic-planning consulting with document creation. He works extensively with federal agencies to help focus their ideas and then produces the publications that describe them. Grabhorn outputs final film directly to a PostScript imagesetter rather than working through a proprietary prepress system. "I've made some real waves in the government world. This is completely new to them."

good work, but they can't match the features and specs of the drum models, and are not the imagesetters of choice for color.

• The Expertise Gap Technology, as the CEPS advocates are quick to point out, is useless without the skill to make it work, and it's quite true that the expertise gap has replaced inferior technology as the most limiting factor in PostScript prepress. But many of the better PostScript-based service bureaus have been doing color for years

now. They have invested heavily in equipment and training, and some have even hired expertise away from traditional color services and printers. Service bureaus that specialize in color may be exceptions, but they do exist.

In a parallel trend, a growing number of conventional prepress shops, adopting an if-you-can't-beat-'emjoin-'em attitude, are bringing imagesetters under their roofs—a sign that the Post-Script market has matured.

Money Matters

The first thing that people who are considering a change in their production process want to know is whether the switch will save money. The answer in the case of Mac prepress is yes, but the savings may not be in the form of hard production dollars. Time, as they say, is also money.

If you are looking to cut your prepress bill, the proprietary-links CEPS path to Mac prepress probably isn't for you. Prepress shops using these systems have invested millions of dollars and emphasize personal service. Their costs are high.

Many people initially believed that the prepress-links systems would lower costs at CEPS service bureaus by

reducing the system and staff time required to produce pages. But it soon turned out that hitches in the Post-Script-to-proprietary translation made the process anything but automatic. As I write this, for example, none of the CEPS RIPs can automatically bring over a color TIFF file placed in a layout; only Crosfield and Scitex can correctly interpret a call for white type to knock out of a photograph; only Hell can automatically separate spot color in a four-color page and print a fifth sheet

File Edit Mode Image Select IDIndow Mail

| Compared to the content of the conten

Programs such as Adobe Photoshop give you control over how colors will print, making it possible to do prepress on the Mac. But having the capability to do the color work on the Mac is not enough: operators still need to understand color printing to effectively use these tools.

of film for special inks. None of the systems can interpret information from programs like QuarkXPress, Adobe Illustrator, or Aldus FreeHand about how elements should overprint—which means that any trapping you might try to do on the Mac will be a waste of time. Workarounds exist for all of these problems, but they typically require staff time on the CEPS system or have other disadvantages.

Prepress-links production, on the other hand, generally isn't any *more* expensive than traditional stripping and separation, and you still enjoy the benefits of desktop design. In addition, industrious publishers willing to coordinate closely with the CEPS service bureau and do as much of the production work as possible themselves may actually save money on some jobs.

The ideal job for prepress-links production is one in which multiple pictures on a page fall into rectangular boxes; catalogs are the most often cited example. Because digital scans are easily archived, anyone who frequently reuses pictures—as long as they reuse them at similar sizes—will also save money.

In contrast to CEPS shops, Post-Script service bureaus, with their lower equipment and staff costs, have been extremely aggressive in their pricing. How aggressive? Results of an informal survey I sent out to ten Post-Script and CEPS service bureaus around the country indicate that bringing fully composed color pages

to a PostScript service bureau costs, on the average, half what it costs to send files through a prepress link or to do it traditionally.

The survey asked for cost estimates of a half-dozen jobs of varying complexity. To make the level of service comparable between CEPS and PostScript shops, I asked the PostScript shops to include a color-correction cycle in their estimates. So the 50 percent savings figure for the Post-Script route includes the cost of a preliminary proof of the scans—typically handed over along with the low-res position file—and a guarantee

Navigating the Low Road

SERVICE BUREAU

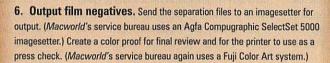


Color proofer

Retouching

Here is the basic process for PostScript-based color prepress, using these two pages as an example. The precise division of labor varies among publications.

- 1. Scan photos. Send photographs as transparencies to a service bureau for hi-res scanning. (Macworld uses the services of Digital Pre-Press International.) Designer receives lowres versions of scans for placement in layout program.
- 2. Create files, Create text and computer-generated images, including object-oriented graphics (for example, in Adobe Illustrator or Aldus Free-Hand) and bitmapped graphics (for example, in Adobe Photoshop, in SuperMac's PixelPaint, or via a screen-capture program).
- 3. Fine-tune images. Do color correction and retouching of color scans using a Mac or a dedicated retouching system. (Macworld's sershop.) Output a color proof to verify color. (Macworld's service bureau outputs proofs on a Fuji Color Art system.) Do further retouching or correction if necessary.
- elements in a page-layout program such as Aldus PageMaker or Quark-XPress. (This layout includes a scanned photograph, an object-oriented EPS file with linked TIFF images, a computer-generated screen shot. type, and various color elements generated in PageMaker.)
- vice bureau retouches scans in Photo-
- 4. Do the layout. Place all
- 5. Send final layout to the service bureau. For PageMaker, export the layout as a .SEP file. Substitute the high-res scanned photos for low-res versions in the layout. Run Aldus PrePrint to make color separations. For Quark-XPress, substitute the high-res scans and make the color separations from within QuarkXPress. (Macworld uses the PageMaker/PrePrint option.)











that final color will match the original transparency.

Many Mac publishers currently pursue a partial desktop solution to color, stripping individual CEPS photo separations into pages that have been imageset with color type and tints in position. To see if going all-desktop is worth the effort, I also asked for a bid using this half-and-half approach. Again, the fully composed Mac pages were significantly less expensive—a third less than the mixed method.

Naturally, not everyone who goes to a PostScript service bureau for production will save 50 or even 25 percent. Shops vary, as do users. To best exploit the potential for cost savings, you have to shop around and work intelligently. Avoid, for example, providing unnecessarily complex Post-Script files that take forever to print, and learn to do your own trapping in programs like FreeHand and Ouark-XPress. (For an introduction to trapping, see "Setting Traps," Macworld, May 1991. For advice on working with color files, see "Prepress Progress Report," Macworld, October 1990.)

Money Isn't Everything

Both high- and low-road publishers agree that desktop production of color pages saves time and effort and can actually result in better products. One obvious advantage is that once you have a color page, the cost of adding color elements is small, since the main cost-color separation-does not depend on the amount of color used. "If it were done conventionally, we just couldn't afford the stripping and redos that would be involved in the amount of color we use," notes Michael Grossman, design director of the very colorful Entertainment Weekly (produced via Scitex's VIP).

Another aspect of quality is control, a word frequently heard on the lips of Mac color publishers. These individuals like knowing that when they crop a picture, trap an illustration, cut a silhouette, or correct color to bring out the nuances in a photograph, what comes back from the prepress service bureau won't be an interpretation or approximation. Some call it design integrity; others focus on the time saved from not having to send unsatisfactory work back.

The time savings that comes from doing full-color Mac design probably won't come in the form of shorter turnaround for film production. In fact, you might want to leave an extra day at the end of your production

cycle in case anything goes wrong. Remember that although a traditional prepress service bureau can always put more color strippers on a rush job, there's no way to break up a complex digital page so that two machines can process it. Also, strippers and pasteup artists rarely just give up on a job, as computers sometimes do—for reasons that often take hours to track down.

The most significant time savings are the result of collapsing the design and production processes into one. Janet Waegel was the design director on the launch of the Scitex VIP–produced *TV Time*, a weekly viewer's guide. "We do this with fewer people and in half the time it would take us doing it traditionally," she says. "Once a layout is done, it's there, it's finished. There's no late-night quilting bee gluing it down, and no time spent cutting film. It's a one-stop process."

Of course, preparing your own pages for output can mean spending extra time on jobs you never had to do before, like trapping. Generally, however, the designers I spoke with felt strongly that the trade-offs were balanced in their favor. Tim Boyse of Ikon Creative Services in Los Angeles recently created some packaging for RCA-Columbia Pictures Home Video.

for approval, and then go back and remove backgrounds from type so a color house can have line art to shoot."

Three aspects of fully integrated desktop publishing work together to make the process a flexible one when it comes to making changes to design or copy. The most important is that you do not send out for film until the absolute end of the production cycle. Another is that you can resize scans up to that final step. And the third is that it is easy and inexpensive to generate very accurate color mock-ups.

Tighter mock-ups sound like a simple matter, but the ability to see what a job will actually look like combined with the ability to make even substantial revisions easily and inexpensively can have a profound effect on people's work routine and relationship with clients. "The main advantage is not making last-minute changes to film," notes Don MacLeish, print manager at Lawrence Advertising in Anaheim, California, which produces retail ads for Standard Brands Paints (a fussy client where color is concerned). MacLeish takes his client through two revision cycles using QMS color printouts, and then moves on to a previously unimaginable step: "The buyer comes in [to the imagesetter change. The Linotype-Hell merger is a symbol of the current state of affairs—the joining of one of the CEPS pioneers with the firm whose Linotronic brand name is a synonym for imagesetters. It is clear that as time goes by, the differences between the two roads to Mac color will diminish, but meanwhile, those picking a Macbased prepress method will do well to take a few considerations besides price into account.

One consideration is quality. Perhaps more because of knowledge than technology, CEPS service bureaus still produce the highest-quality separations. Their work is also more consistent, requiring fewer rounds of corrections, and they trap pages correctly. In Macintosh page-layout programs, only the most ingenious workaround artists can find ways to trap all the elements they want to use (though proper trapping is quite possible for people who work in FreeHand or Illustrator). As a general rule, publications that live or die by the quality of their color-fashion magazines, coffee-table books, luxury catalogsshould stay with the high end.

At the moment, PostScript imagesetters are also incapable of producing poster-size work. (This may change, however. By the time you read this a company called Optrotech Graphic Arts should have released the Sprint 110, a drum-based imagesetter with a print area of 39.3 inches by 32 inches.)

Service and support vary from business to business, but overall the PostScript service bureau is a more do-it-yourself kind of place and offers fewer services. If you go the PostScript route, you'll likely be encouraged to learn to trap the artwork yourself and perhaps to make your own color separations (though many shops will gladly provide these and other services, such as retouching, usually at reasonable rates). PostScript service bureaus almost certainly won't employ any traditional strippers, nor will they correct color film by manually etching dots on it; some PostScript shops may even send out for color proofs or scans. CEPS shops serious about Macintosh color prepress, on the other hand, often have their own PostScript imagesetters, which they use for mak-

Publications that live or die by the quality of their color should stay with the high end. But the differences between the two roads to Mac color are diminishing. For most publishers, both approaches now offer good quality.

"Three years ago, doing pasteup by hand, it took three people about 24 hours to produce a mechanical of a videotape box," Boyse says. "Now—even though we're setting the type and making the separations ourselves—I can do a box in three or four hours." Asked whether the main difference was just using the Mac in the first place—for type and tints—or doing fully paginated designs, Boyse responds that "going halfway is a big waste of time. It doesn't make sense to produce a tight black-and-white just

service bureau] and we bring the ad up on the calibrated screen, which has truer colors than the QMS. We stand over the operator's shoulder while he corrects color, makes changes, or retouches—and then it's straight to film." While presenting the so-called soft proof at the color service is a bit unusual, on-screen proofing sessions are becoming remarkably common.

Which Way?

The printing and prepress business is going through a period of dramatic

HELL'S ANGLES

sually, the last thing most publishers want to concern themselves with is the process by which highresolution printing devices calculate the angles of halftone screens used in four-color film. But new developments are making one aspect of this abstruse process-the difference between rational and irrational screening-something Post-Script publishers who want to get the highest quality need to understand. If you imagine a page as a piece of graph paper divided into very small squares, a rational screening system demands that all halftone dots fall within the squares: they can't fall on a line. This is fine if the rows of halftone dots are at 90 or 45 degrees, but four-color printing requires four nonoverlapping angles-usually at 45, 90, 75,

and 15 degrees. As anyone who's played with graph paper knows, there's no way to fit rows of dots at 15 and 75 degrees neatly on the grid squares. You have to approximate. This approximation is a major source of moirés in Post-Script halftoning, which has always used a rational screen method. By trial and error, Adobe and other developers have found the best approximations of the traditional angles, and PostScript printing is not the problem it once was.

As this article was being written, however, alternative technologies promising to improve the situation even further were beginning to emerge. The biggest news is that imagesetter users now have access to irrational techniques similar to those used on high-end CEPS

systems, Irrational screening is a very complex matter mathematically, but it essentially amounts to the ability to place dots on the lines of the graph paper, thus eliminating the need to round off angles. Hell holds the patents on irrational technology and has previously shared them only with the other Big Four CEPS makers (Scitex, Crosfield, and Dainippon Screen). Following the Linotype-Hell merger last year, however, the company released an irrational screening system as an option for its RIP 30 processor and as part of its new RIP 40. Early reports say that the results from this system, which the company calls HQS, are excellent.

Although blocked by Linotype-Hell from using the tried-and-true irrational techniques, Adobe has meanwhile invented a completely new halftoning method, dubbed Accurate Screens. By the time you read this, the technology, which Adobe claims will be every bit as good as the Linotype-Hell standard, may be available on imagesetters using variations of Adobe's Emerald RIP technology.

The Optronics ColorSetter 2000 has always used proprietary hardware and software that reduce screening inaccuracies. The company says that by the end of this year it will release a completely new screening system based on its own and Linotype-Hell's irrational technologies (the two firms entered into cross-licensing agreements earlier this year). Optronics says the new screening method will add clarity and better tonal modulation to separations.

ing text changes or for outputting complex PostScript graphics. That's the nice thing about the high end: one way or another, they can always deliver the job.

Whether you go the PostScript or CEPS route, remember that the shop you end up working with will be your partner in production. Interview prospective partners carefully before picking one. Look at samples of the work they've done. If you go with a PostScript shop, try to find one with experienced color-printing professionals on staff. If you go the CEPS route, be sure to probe the staff on their level of experience with desktop publishing. In either case, get a sense of how long they've been doing desktop color, how much effort they've put into it, and how much work they've produced.

The service bureaus that are making this process work recognize that many users need help to succeed at color production. Larger service bureaus may offer seminars or have publications they have prepared that explain the color-publishing process. And the good PostScript service bureaus offer to teach you how to trap files or how to calibrate color-separation software.

Once you have picked a prepress service bureau, be sure to coordinate with the staff carefully before you produce your first job. Describe the job carefully, being sure to mention all the programs you're using and all the elements the pages are likely to contain, as well as how the job will be printed. If you go to a CEPS service bureau, be sure to ask about the problem elements, such as PostScript graphics with lots of blends, or files with a fifth color. Such elements may require special handling, and waiting to handle them until after you turn the job in for output is a good way to blow both your deadline and your budget.

Whether you follow the high or low road, two final pieces of advice will stand you in good stead. First, do not try to change over your entire operation in one swoop—especially if you're on deadline. If you publish a magazine, for example, start with one or two articles, then evaluate the process to see where the snags are.

Second, learn as much as you can about color printing. Talk to your prepress service bureau, go to a press check and ask questions, read books, experiment. The more you learn, the more control over the process you'll gain, and the more new things you'll be able to achieve. Before long you may be surprised at how something you began for efficiency's sake has become a source of great creative satisfaction.

See Where to Buy for contact information.

.

Contributing editor Joe Matazzoni is a consultant and writer living in Oakland, California. He has followed digital imaging for Macworld for the last five years.





THIS YEAR'S ROUNDUP OF GRAY-SCALE SCANNERS MAY STARTLE YOU FOR AN UNLIKELY REASON. Bucking the trend seen in

Macworld

Lab ranks 13

gray-scale

scanners for

image quality,

speed, and

software

nearly every other peripheral group, these scanners haven't changed much since last year. There are a few minor surprises, software improvements, and some new contenders, but the top choice remains the same as last year's—the Xerox Imaging Systems GS plus—and several other products held steady as well (see "Grade-A Gray Scale," *Macworld*, October 1990).

We love innovation, but those rare occasions when technology lets us catch our breath offer important opportunities. We know these scanners so well that we could refine our tests to reflect more clearly the nuances that often distinguish the best machines from the pretenders.

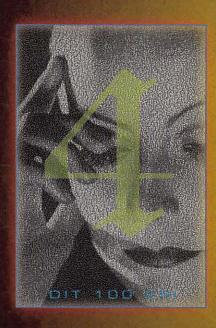
The most important test measured shadow sensitivity—how well scanners differentiate among subtleties in shadow areas. Next in importance, we recorded how much image-altering electronic noise, or static, scanners generate. We also judged how well the scanners capture detailed line art, and we timed their scanning speeds.

by Steve Roth





















Quality Control

Before you leap to the test results, however, consider the factors that contribute to each scanner's scores. No scanner grabs a perfect image. Most scanning software includes brightness and contrast sliders that let you adjust the gray levels in an image. The trouble with those two controls is that they throw away information. When you brighten an image to bring out dark details, for instance, light areas wash out to white. The better scanners also provide gamma control, a correction technique that improves image quality without throwing away information indiscriminately. You can bring out details in

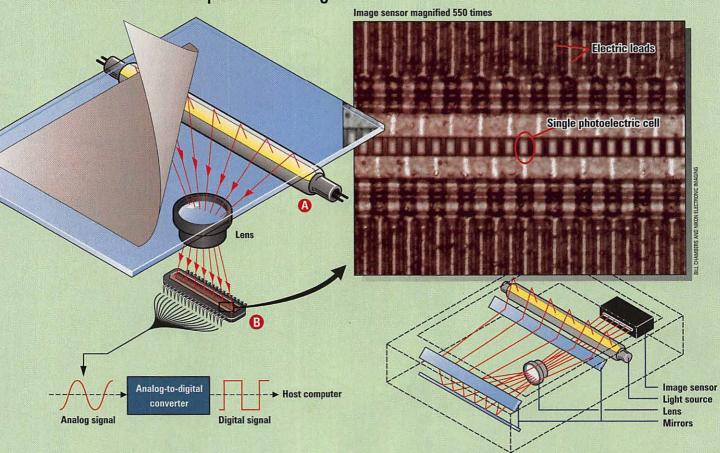
shadows, for instance, without losing the details in the light areas.

And almost every scan destined for printed output needs *sharpening*—a method to reduce blurriness, especially in details (see "Looking Sharp"). With some effort, you can sharpen scans after they're captured in Letraset's ImageStudio, Aldus Digital Darkroom, or Adobe Photoshop (which provides the best sharpening filters). Only one scanner in this roundup provides sharpening while you're scanning—the Agfa Focus II GSE Scanner.

It may not seem like it, but scanners are sort of like radios. In their attempts to capture information, scanners generally come up with some static. With scanners, this noise appears as stray pixels that don't match the gray in a particular area. It causes a speckled look that is especially visible in lower-resolution scans and is accentuated by sharpening.

Though it can look similar to noise, a *diffusion dither*—a way to reconfigure the dot pattern of a scan to boost image clarity—actually improves a laser-output scan. If you plan to produce much of your work on lasers (as opposed to imagesetters), look for a scanner with a good diffusion dither, or software (such as Photoshop) that lets you create a diffusion dither from a gray-scale scan.

How Scanners Capture an Image



Gray-scale scanners capture an image by converting varying intensities of light to digital signals that can be interpreted by the Macintosh. Through a variety of mechanical schemes, such as the mechanism used by the Hewlett-Packard HP ScanJet Plus shown in the inset at bottom right, a light source (A) passes across the paper image to be scanned. The image is reflected, often through a lens, onto an image sensor (B). This sensor, composed of microscopic photoelectric cells (see image at top right), produces electrical impulses of varying voltages—higher voltages are generated by lighter, more reflective areas on the image, lower voltages by darker areas. The analog voltage signal is fed into an analog-to-digital converter chip, which then forwards the digital signal to the computer.

Speed Factors

In Macworld Lab tests the scanning times varied by only a factor of two from the fastest (the Pentax IQ Scan, with an average scan time of 31 seconds) to the slowest (the Abaton Scan 300/GS, with an average of 67 seconds), not counting the plodding ThunderWorks-driven Apple Scanner and ThunderScan Plus (see "ThunderScanning"). These reasonably close times eliminate scanning speed as a major buying consideration except for high-volume users.

You should be more concerned about speed if you work with a scan in Photoshop or another image processor. The results can be excellent, but the time penalties steep.

Driving the Scanners

Several scanners have moved away from DAs and stand-alone scanning programs, instead offering plug-in modules that let you scan from within ImageStudio, Photoshop, and Digital Darkroom. (Photoshop can use Digital Darkroom's plug-ins, and all the plug-ins we tested worked with both.) Several scanners also come with one of those programs. The scanners that include Photoshop have opted for

THUNDERSCANNING

The ThunderScan Plus, from Thunderware, is an innovative little \$249 device that turns an ImageWriter into a scanner. The ThunderScan replaces the printer's ribbon cartridge, so instead of the ImageWriter putting an image on the paper, the ThunderScan captures the image that's already on the paper fed into the printer.

Unfortunately, this clever device works poorly. It placed near the bottom of both our shadow-sensitivity and noise tests, and fared abysmally on the line-art test. With a great deal of time (an hour or more) and laborious adjustments, you can get an OK scan, but it will never be adequate for a newsletter with even mediocre production values. If you're serious about capturing quality images, don't waste your time considering the ThunderScan.





Shadow Detail Some scanners do a far better job distinguishing subtle differences in dark areas. On the left is a scan from the Xerox GS plus. Note the crisp detail in the man's coat. On the right is the same image scanned with the Dest PC Scan 3000. Notice the streaking.

Photoshop LE, or Limited Edition, which doesn't make separations.

One thing that improved this year is the way scanning software handles the scaling/resolution question. Some of the scanners (from Apple, AVR, Canon, Dest, Pentax, and Prime Option) still make you do the arithmetic if you want a scan of a certain size at a certain resolution, but the others do the math for you.

Some scanners have increased resolution—but be skeptical. The lineart test shows that higher resolution does not necessarily mean better line art. The 400-dpi Agfa Focus II GSE Scanner and 600-dpi Prime Option

Phovos 600GS did not produce better line art than that of some of their 300-dpi counterparts.

In another minor change this year, more scanners *interpolate* dots—add extra dots between scanned dots to simulate higher resolution. This method does not pick up additional detail, but it does result in smoother output with fewer jaggies.

The following ranking reflects how well the scanners handle these considerations. Now, in true David Letterman style, here are the scanners from the bottom up—worst to best.

Pentax IQ Scan

When you think Pentax you think great optics, right? Think again. Despite a curvaceous, space-age design, the Pentax IQ Scan is a terrible machine. First and foremost, it offers only 4-bit (16-gray-level) scans. Given that deficiency, its shadow-sensitivity results were impressive—until

we saw the noise test. The Pentax scored far below any other gray-scale flatbed. This scanner captures subtle differences, but drowns them out with noise. Its line-art results are similarly disappointing.

The IQ Scan's two pieces of software both scan only to memory, not to the hard drive. The DA doesn't even have a preview, so you're selecting blind. It does have five-level gamma control and a selection of five dither patterns (though no diffusion dither). The Photoshop plug-in has a preview, along with the basic controls for scan area, mode, and resolution. And unlike the DA, the Photoshop module shows available and required memory for the scan. But that's about all. Despite its futuristic looks, the only way to describe the IQ Scan is primitive.

Apple Scanner

When it came out a few years ago, the Apple Scanner was a standout, with some of the best software around. But this 4-bit unit has not aged gracefully. It failed the shadow-sensitivity test miserably and placed near the bottom in the noise and line-art tests. Its once-innovative software now looks unnecessarily complicated. The original Apple Scanner included the AppleScan application and HyperScan, a clever stack Andy Hertzfeld created for scanning into HyperCard, but now it comes with only AppleScan.

If you already have an Apple Scanner, however, Thunderware's ThunderWorks for the Apple Scanner software (\$149) is worth buying for the throw-scrolling feature alone. Move the image with a grabber hand, and when you release the mouse, the image keeps moving in order to review

		Advanced Vision	Agfa					
	Abaton	Research (AVR)	Compugraphic	Apple Compute	r Canon USA	Dest Corporation	Hewlett-Packard	Pentax
Scanners	Scan 300/GS *	AVR 3000/GS Plus	Agfa Focus II GSE	Apple Scanner	Canon IX-30F	PC Scan 3000	HP ScanJet Plus	Pentax IQ Scan
Price	\$1595	\$1990	\$5495	\$1799	\$1545	\$2040	\$1590	\$995
Shows disk space or memory (required/available)	●/●	●/●	●/●	0/0	●/●	0/0	●/○	e/e ‡
Memory or disk limited	disk	disk	disk	disk	disk	disk	disk	memory
Internal SCSI interface	• :	● II	•	•	. •	•	0	•
Resolution settings/ Increments (in dpi)	75, 100, 150, 200, 240, 300 *, 72–300/1 **	72–300/1	13 settings, 100–800	75, 150, 200, 300	75, 150, 200, 300	38-600/1	12-600"/1	39-300/3
Maximum optical resolution	300	300	400	300	300	300	300	300
Gray-level options	2, 16, 256	2, 256	2, 64, 256	2, 16 **	2, 256	2, 256	2, 16, 256	2, 16
Bundled software 117	IS or DD, APC, AS	PLE	MCV	AP	SD	PP	DS	io .
Scanning modules	IS, DD/PS	DD/PS	_	-	-		_	DD/PS
Gray preview	0	0	0	0	0	0	•	Θ ε ς και
Diffusion dither	0	0	0	0	. •	0	•	0
Gamma control (during scan/	• ··· /o	0/●	●/○	0/0	0/0	0/0	0/0	●/0
after scanning)		<u>ara a efit ta</u>						n de la companya della companya della companya de la companya della companya dell
Sharpening (during scan/ after scanning)	0/0	0/●	●/○	0/0	0/0	0/0	0/0	O/O
Maximum image size	8.5 x 14	8.5 x 14	8.3 x 12.7	8.5 x 14	8.5 x 11 ***	8.5 x 14	8.5 x 1,1 ***	8.5 x 14

• = yes; O= no. * The Scan 300/S model, for \$1195, comes with 16 gray levels. * Optional Picture Pac holder for books and magazines, \$525. * No/no when using DA. * Not with ImageCopy DA. ** With Photoshop. ** With ImageStudio and Abaton Scan DA. ** Resolution option up to 1500 dpi, but only at smaller scaling percentages. ** Limited by zoom level and image size. An area of any previous scan serves as gray preview. ** With MacImage. ** ** Can increase to 64 with ThunderWorks software (\$149). *** 2 and 256 only with Photoshop plug-in. *** AppleScan, APC = Abaton Printer Calibration, AS = Abaton Scan DA, DD = Digital Darkroom, DS = DeskScan DA,

a large image in a small window—every program should have it.

ThunderWorks uses multiple passes to capture 64 levels of gray, but this process takes more than twice as long as the next slowest scanner does, and the results aren't much to crow about. For \$1799, forget the Apple Scanner.

Dest PC Scan 3000

The Dest PC Scan 3000 came out near the bottom in the shadow-sensitivity and noise tests. It's surprising that the noise test came out even that well because the scanner displays obvious streaking (see "Shadow Detail").

The PC Scan 3000's Publish Pac scanning software is adequate, though you need to go through three dialog boxes to set up scanning parameters. There are five zoom levels once you've captured the scan (convenient for checking details), and a decent help system.

But the previewing feature is abysmal. As soon as you drag a scanning selection over the small black-and-white preview, everything outside the selection disappears. When you zoom in on the preview, the PC Scan 3000 just magnifies the already jaggy image into an unrecognizable mass. Publish Pac has automatic contrast

and brightness adjustments, but these don't work well either. This scanner is nothing special, and neither is the \$2040 price.

AVR 3000/GS Plus

The AVR 3000/GS Plus registered average results in all tests, and its software has fewer features than any of the other scanners. This unit offers control over mode (256 gray-scale, halftone, or line art), contrast, brightness, and resolution. That's it. There's a black-and-white preview, and a pointer tool to select the scanning area. (A quirk in the pointer reveals the scanner's non-Macintosh origins—it points the wrong way—up and to the right.) At \$1990, pass on this one.

Canon IX-30F

The Canon IX-30F is about as middle-of-the-road as you can get—in all our tests, in price (\$1545), and in soft-ware quality. This machine lacks controls for brightness in gray-scale and halftone modes and has no contrast control—period—much less gamma. The IX-30F offers a basic set of paint tools (pencil, eraser, marquee, gray palette, and convenient seven-level zooming) for cleaning up scans, and a decent-size scan preview (though it's

black and white). We found nothing terribly wrong with this scanner, but nothing to recommend it either.

Truvel TZ-3

The Truvel TZ-3 is the only overhead scanner in this roundup. Its lens, mounted on a moving arm, passes above a flat bed. Place a special target sheet on the scanner bed, then turn the aperture, focusing, and zooming rings on the lens until the image is set up right. This can be tricky and time-consuming, and you have to go through it just about every time you change the size of the scanning area. And the size of the scanning area is limited by memory—a terrible flaw in a scanner capable of 900-dpi, 256-graylevel scanning. (Figure 6MB per square inch at those settings.) All this trouble results in slow, clean scans, with little noise, that unfortunately don't pick up shadow detail terribly well-hardly a ringing endorsement for a \$7690 machine.

The TZ-3 stands out, however, in capturing line art at high resolution. In our tests, scanning at 841 dpi, the TZ-3 scored far and away better than any other scanner. If you can't live without top-quality line-art scanning, buy this machine. If your needs are any more general, forget about it.

			Umax	Xerox
Prime Option	Thunderware	Truvel	Technologies	Imaging Systems
Phovos 600GS	ThunderScan Plus	TZ-3	UG80 Grayscale	GS plus
\$1995	\$249	\$7690 1	\$1495	\$1995
•/•	0/0	0/0	0/0	0/0 '
disk	memory	memory	disk	disk
•	NA	0	•	•
61-2540/1	18-576/1	1-900/1 **	1-300/1	75–300/1 ⁵⁵ , 75–120/5, 120–300/10 ^[1]
600	288	900	300	300
2, 256	2, 64	2, 4, 16, 256 ***	2, 16, 256	2, 16, 256
PLE	TW	TS	IS	MI, IC
DD/PS		DD/PS	IS, DD/PS	
0	NA	0	•	• II
•	0	0	0	•"
•/•	•/•	0/0	0/• ***	• **/0
0/•	0/•	0/0	O/ • ***	0/0
8.5 x 14	11 x 14	12 x 17	8.5 x 14	8.5 x 14

IC = ImageCopy DA, IQ = IQ Scan PSDA, IS = ImageStudio, MCV = McView, MI = MacImage, PP = Publish Pac, PS = Photoshop, PLE = Photoshop LE, SD = ScanDo, TS = TruScan, TW = ThunderWorks. *** Three levels. *** Thr

Umax UG80 Grayscale Scanner

One of last year's newcomers, the \$1495 Umax UG80, fared well in our shadow-sensitivity and speed tests. And its software (plug-ins for Photoshop/Digital Darkroom and Image-Ştudio) has improved since last year, allowing you to change scale or resolution independently, with the software doing the arithmetic.

The documentation hasn't improved, however; there is none aside from what comes with the bundled copy of ImageStudio, and a couple of cryptic Read Me files. And the UG80 really fell down in our line-art trials, dropping it out of serious competition with the scanners that follow.

Abaton Scan 300/S

The 4-bit Abaton Scan 300/S is basically identical in software and function to its sibling, the 8-bit Scan 300/GS, which is one of our top choices in this roundup. You can't expect high-quality imagesetter halftones out of this scanner, but at \$1195, the price is right (as is the software) for line-art work and if you're scanning images for position only.

Agfa Focus II GSE Scanner

The Agfa Focus II offers several attractive qualities. Its McView software

features reasonably impressive gamma control and includes options for adjusting the lightness of highlights and shadows, an automatic density control option, a user-definable correction curve, and a set of canned corrections such as Dark Original and Brighten Highlights. The asyou-scan sharpening also works

well, though not as well as Photoshop's filters. (All of the Agfa Focus II's controls would be much more useful if the manual's explanation went beyond a few terse, uninformative sentences.)

Other features include a descreening option for removing the dots from previously halftoned material (basically a blurring filter; Photoshop's works better), and a feature that corrects for out-of-alignment lineart scans. You draw a line parallel to a horizontal line in the scan, and

McView rotates, in 1-degree increments, the whole picture to align with the horizontal. It's a good idea, but many jobs require movements finer than 1 degree.

McView also provides *vectoriza-tion*—conversion of bitmaps to objects that you can save in various popular formats. It also allows calibration for fine-tuning output; adjustments of halftone *screen frequency* (the number of lines per inch) and angle for proof prints and EPS saves; a densitometer for checking gray values in scans; and basic paint tools for cleaning them up.

The Focus II was one of the top choices last year, based on excellent shadow sensitivity, but its shadow results this year disappointed us. It placed fourth in noise, and its line-art output was average. This scanner still shows promise as a production workhorse, but at \$5495, smart shoppers will steer clear.



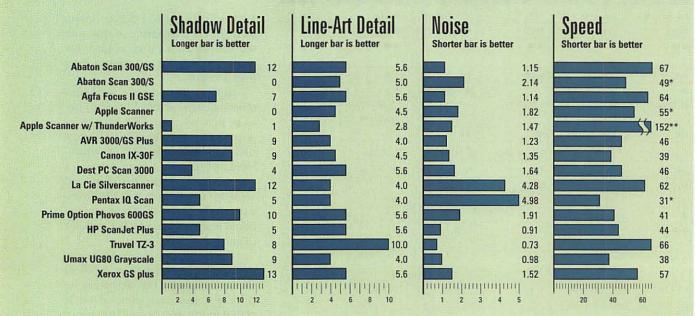
The top three: Clockwise from top, the Abaton Scan 300/GS, the Xerox Imaging Systems GS plus, and the Hewlett-Packard ScanJet Plus.

Prime Option Phovos 600GS

Prime Option entered the gray-scale field this year with its \$1995 Phovos 600GS, a true 600-dpi flatbed scanner that can interpolate up to 2400 dpi. The 600GS posted respectable shadow sensitivity results, aided by as-you-scan gamma-correction settings (vaguely named Sharpen, Smoothing, and Linear, though you won't find them explained anywhere).

We expected the 600-dpi resolution to make a big difference in the line-art test, but it didn't. The 600GS ERIC HARG

Scanner Tests



Shadow Detail Distinguishing between subtle gray differences in dark areas is a gray-scale scanner's most difficult task. We measured the values that each scanner captured when scanning a calibrated 32-gray-level test strip; the differences in the darkest 5 to 8 bars on the strip are so subtle that they're hard to detect with the naked eye. The graphs you see above are simple counts of how many subtle differences among the darkest 16 bars could be distinguished by each scanner. The higher the score, the better the scanner differentiates between gray values in dark areas. To determine these numbers, we calculated the mean gray value of all the pixels that each scanner captured for each gray bar. The pixels in a medium-gray bar might have an average value of 133 (an ideal black would be 256), for instance; a light bar might have an average value of 29. Then we looked at the difference in average value between adjacent bars on each scan to determine that scanner's ability to distinguish those two gray levels.

Line-Art Detail To find out how well these scanners capture line art the tiny details, such as the patterns in an old-fashioned etching—we scanned a series of progressively more tightly stacked lines from a test sheet. If we could count how many lines there were in the scan, the scanner did its job. The value you see here is the maximum number of lines per millimeter that each scanner could recognize when scanning at its highest resolution.

Noise Electronic noise generated by a scanner affects consistency. Every pixel should be identical in a given gray bar; to evaluate the scanners' consistency we measured the standard deviation, or spread, of values within each of 37 different gray bars as scanned by each scanner. The results shown are the averages of those values for each scanner.

Speed We timed two 8-by-11-inch scans—one at 300 dpi in line-art mode, the other at 200 dpi in gray-scale mode (at 256 gray-levels, except as noted). The numbers shown here represent averages of the gray-scale and line-art results, in seconds. If a scanner could be driven by more than one program, we measured the times in each program (they varied widely) and averaged the results.

*Scanned at 16 gray levels. **Scanned at 64 gray levels.

really faltered, though, in the amount of noise it generated—producing obviously stippled images at lower resolutions.

The Phovos 600GS comes with a Photoshop plug-in and an *rdev*—a Chooser item—to select the scanner in the Chooser. This can be exasperating; you have to go to the Chooser to switch between scanning and printing. Even worse, the flatbed's cover will not stay up by itself. Other nits to pick: the Phovos 600GS cannot scale while scanning and offers only a small, black-and-white preview. Several ostensibly sophisticated options, such as MTF Correction, and Bold Lining, are not explained in the paltry documentation.

Hewlett-Packard ScanJet Plus

A few years ago Hewlett-Packard brought reality to gray-scale scanner prices with the ScanJet Plus, priced at a then-incredible \$2090. That price just dropped a whole lot more—to \$1590—again undercutting just about every other comparable scanner.

For that money you get a scanner that scored near the top in noise and average in line-art trials, but that fared poorly in shadow sensitivity, making its excellent noise control nearly irrelevant. And there are no gamma controls to help you clarify details. The ScanJet Plus is just average in its scanning speed.

The ScanJet Plus's easy-to-use DeskScan software partially compensates for these failings. DeskScan's unique gray-scale Live Preview updates the preview image every time you change a setting. Though it's a small preview, you can zoom in on a selection, and DeskScan rescans that area so you can examine it in detail. The option for automatic contrast and brightness adjustment is convenient, though you still have to fine-tune those settings manually.

Another winning feature is the ability to scan directly to the printer (for trying scans out quickly or using the ScanJet and your printer as a slow copying machine).

Even with these assets, there is only one compelling reason to buy the ScanJet Plus: some programs, such as Microsoft Word, require scans to be pasted in from the Clipboard. The ScanJet Plus can scan directly to the Clipboard, accommodating this idiosyncrasy for about \$400 less than the similar (though higher-quality) Xerox GS plus.

Abaton Scan 300/GS

The Abaton Scan 300/GS was the surprise of this roundup. It was second only to the Xerox GS plus in detecting shadow details and came in a respectable fifth in our noise tests. The three gamma settings further improve that gray response. Line-art results were average.

The Scan 300/GS's software includes either ImageStudio or Digital Darkroom (your choice), a scanning DA, and plug-ins for Photoshop/Digital Darkroom and ImageStudio. (Among these software choices, avoid the Photoshop plug-in, which has disappointing resolution choices and cannot scale an image while scanning.) There's a stand-alone calibra-





Looking Sharp Nothing does more to improve the look of scanned images than sharpening. The image on the left was printed as scanned. The image on the right was sharpened with Photoshop 2.0's Unsharp Masking filter.

tion program that lets you modify scans so they print looking more like what you see on screen, and an informative how-to HyperCard stack (though it explains more about the scanner than about the Mac software).

The Abaton Scan DA suffers from a major bug—it treats line-art scans like gray scale for the sake of required memory, meaning you need eight times as much memory as is really required for line art. The only other disappointments in this \$1595 scanner are the speed (it's more than 45 percent slower than the Xerox GS plus

for gray-scale scans) and the lack of a diffusion dither.

Xerox Imaging Systems GS plus

When Xerox bought Datacopy a couple of years ago and the old hands from Datacopy left, bets were that the great scanners and software that Datacopy produced would dry up in a couple of years. But the GS plus hangs on as my favorite gray-scale scanner.

The GS plus led the pack in shadow sensitivity, and although it placed low in the noise test, it wasn't noisy enough to interfere much with image quality. It was medium-slow on the speed tests and it was right in the thick of the pack on the line-art test.

What makes the GS plus so attractive,

aside from excellent gray response, is its MacImage software—the best scanning application available—and ImageCopy DA, a quick-and-easy scanning program.

MacImage includes superior gamma correction (including a spate of preset curves and the ability to customize curves), amazing halftoning control, some special gray-scale effects, and 11 zoom levels. The GS plus bundles a calibration program that creates a gamma curve that can then be used in MacImage. MacImage provides the best and easiest way to get good scans, but only after you experiment some and closely study the manuals (Xerox should print new manuals for this version, 2.3, of Mac-Image, rather than rely on a skimpy addendum).

MacImage doesn't have a preview per se, but you can select an area of any previous scan for your next scan.

While MacImage can be daunting for a first-time user, the ImageCopy DA is a breeze (it even allows the GS plus to scan to the Clipboard). Image-Copy's preview, though black and white, is dithered for clarity.

About all I'd add to this \$1995 scanner are a good diffusion dither and some image-modification software, preferably Photoshop. The GS Plus is well worth \$400 (plus the price of Photoshop) more than the Abaton or HP offerings. If you can afford it, this is the scanner to buy.

See Where to Buy for contact information.

THE SILVERSCANNER COLOR OPTION

Can an inexpensive color scanner beat the gray-scale crowd on their own turf? To check it out, we ran the \$1999 La Cie Silverscanner, the favorite inexpensive scanner in our color flatbed scanner roundup (see "Affordable Color Scanning," Macworld, June 1991), through our battery of gray-scale tests.

While the Silverscanner picks up shadow details with the best of the lot, the trade-off is noise far worse than that of any scanner in the gray-scale roundup except the Pentax IQ Scan. So if you're scanning at lower resolutions and using sharpening filters, be prepared for some noticeable speckling and splotchiness. The Silverscanner didn't fare terribly well in the lineart test, and it was average on speed.

If you don't require the very best in gray-scale scanning, however, and feel you might need color scans now or in the future, choose the Silverscanner.

Along these lines, a new 600-dpi color scanner from a longtime leader in the scanner arena merits a close look. Microtek's \$2195 ScanMaker 600ZS, based on the popular but recently discontinued 300ZS model, began shipping at press time. Microtek is also shipping the \$1695 ScanMaker 600GS gray-scale unit based on the old 300GS model. And at press time Hewlett-Packard indicated that it expects to ship a new product, the ScanJet IIc, shortly after this article appears. The \$1995 scanner will feature 24-bit, single-pass color scanning; and 8-bit gray-scale scanning at 400 dpi.

Contributing editor Steve Roth is coauthor of Real World PageMaker 4: Industrial Strength Techniques (Bantam Computer Books, 1990). Living in Seattle, be is intimately familiar with shades of gray.



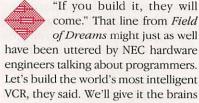
REVIEWS

Computer-Controlled Stereo VCR

PC-VCR

Pros: Accurate to within one frame; feature-packed; excellent VHS, S-VHS, stereo hi-fi VCR in its own right; titling feature; staggering unrealized potential. Cons: Inscrutable manual; programming required to permit Mac control; insufficient, poorly documented software. Company: NEC Technologies.

Requires: Mac Plus. List price: \$2100.



engineers talking about programmers. Let's build the world's most intelligent VCR, they said. We'll give it the brains of a Mac Plus, state-of-the-art video features, and a frame-accurate search capability. Let's give it a serial port, so that any personal computer can give it instructions. And let's hope somebody writes the software that will unleash all this power.

Thus the PC-VCR was born: a magnificent machine, a superlative VCR, designed and executed with great imagination, but shipped with almost no useful software.

It's a VCR

The PC-VCR hardware is slim and attractive. Its color matches the Macintosh, and its tape door and control panel are neatly hidden by a flip-open front panel, as is common in recent high-end VCRs. As a VCR, the unit's features include automatic tracking, S-VHS recording and playback, an eight-event programmable timer, a remote control with an on-screen menu system (which is exactly as hard to understand as on other VCRs), and



indexing to quickly locate newly recorded programs.

The cleverest innovation is the unit's time-code striping scheme. Before you can access any of the PC-VCR's great features, you have to play a cassette from beginning to end, so that the PC-VCR can record framecounting signals onto an unused part of the tape's control track. Incredibly, and unlike SMPTE or other common time-code schemes, the PC-VCR's time-code striping doesn't touch the existing audio or video bands. In other words, you can time-stripe your most valuable tapes, and nobody but the PC-VCR will ever know that it has been modified. (Note to video editors: When you're getting ready preparing to edit footage, this nondestructive time code saves you one generation of tape copying, since you don't have to duplicate the original just to add SMPTE code to the audio track.)

Once you've striped the tape, the VCR can fast-forward or rewind to a specific frame automatically. Actually,

that's not quite true-one of the few drawbacks to the system is that the VCR doesn't actually read the time code when rewinding or fast-forwarding. When it's hunting for a particular time-code address, it zips to a point just before the spot you've specified, slips into play mode for a moment to get its bearings (by reading the time code), then zips some more, and so on. In other words, it finds a spot by using the same trialand-error method you use on a VCRexcept that the PC-VCR does it with mathematical (albeit sometimes still poky) efficiency.

It's a Computer Peripheral

Once you've connected the PC-VCR to the Mac's modem port, the PC-VCR offers much, much more. Seated at the computer, you can control all transport functions (rewind, play, record, stop, pause, and so on); mute the audio; change the record speed; turn the thing on or off; eject the tape; use the character generator to super-

impose titles on something you're recording; and so on. (The character generator is fabulously useful, except that only three sizes of type are offered, in one style [all capitals and no apostrophe], and the larger two sizes look jagged.) In fact, computer control of the VCR permits access to hundreds more possibilities than either the remote control or the front panel offers.

Unfortunately, you have to issue all these commands by programming them. The PC-VCR's own language isn't nearly as difficult to learn as, say, Pascal; everything is a coded two-letter command followed by a number. To change to channel 5, you type in CN5. All of this is documented in the manual, but it's by no means for the layperson; the writing is technical, few examples are provided, and you're never told what you'd use each command *for*.

Worse, to issue these commands, you have to use a telecommunications program like MicroPhone. Typing text codes is about as unfriendly an interface as there is.

The HyperTalk Connection

Fortunately, there's the promise of a better way: HyperTalk. If you're adept at programming in HyperCard, you can use XCMDs to control the VCR too, making it possible to build your own software. (The unit does come with a sample HyperCard application, but it's feature-poor and not frameaccurate.) Alas, these XCMDs aren't documented anywhere; when asked how to learn to use them, NEC spokespeople suggest opening the provided sample stack and "studying" them. (That is, that's what NEC says if you're lucky enough to find somebody in that vast corporation who's ever heard of this product.) After dropping two grand on a piece of equipment, you'd think you'd get a little more help than that.

At the moment, then, the truly incredible powers of the PC-VCR rest in the hands of programmers. But the situation is about to change dramatically. NEC reports that at least 30 companies are developing software for the PC-VCR. Furthermore, NEC plans to replace the currently included software with something much more

powerful. If you want to find out what's available—and whether or not the shipping software has been improved by now—call 800/562-5200; at the prompt, press 632.

When all this software development comes to fruition, it's going to be an amazing time for both home and semipro video jocks. Just thinking about the programs on the way can increase your heart rate. Imagine, a video database: type a keyword, watch the clip play on your screen. Or how about editing software that permits you to hook up two PC-VCRs to edit and dub quickly and easily, with single-frame accuracy.

Developers are also working on a quick, simple way to set the VCR for recording programs: click on the icon representing a television show, and drag it onto the appropriate square of an on-screen calendar. Another program will let you download broadcast-TV listings from Compu-Serve and transmit them to the PC-VCR's internal buffer; now the machine knows what shows will be on when. And finally, imagine presentation software that lets you show clips instead of slides. (A somewhat buggy plug-in already is included with the unit for use with Aldus Persuasion.)

Ahead of Its Time

Technologically speaking, the PC-VCR is about as well done as such a device could be. It doesn't feel like a VCR with something grafted onto it; instead, it feels as though it was designed from the ground up with flexibility and creativity in mind. Of course, having a VCR that can jump to a precise frame of videotape doesn't have as many repercussions in the multimedia world as you might think. For example, you can't click on a HyperCard button that says Go to Closing Credits and immediately watch the gaffers' names scroll by; the PC-VCR is still a VCR, and it still takes time to fast-forward the tape. That's why videodiscs-which provide instant random access-won't become obsolete just yet.

But presenters can minimize tapetransport delays by arranging their video "slides" in the correct order on the tape to begin with. Video editors won't find instant access critical. And high-end video nuts everywhere will welcome the machine's programmable smarts. At the moment, the PC-VCR is a highly communicative machine with nobody to talk to. But when software appears that takes advantage of its flexibility, it will play an interlaced field of dreams.

-David Pogue

See Where to Buy for contact information.



Hardware/Software Security Kit

PASSPROOF

Pros: Simple, elegant, nonintrusive; reasonably effective. **Cons:** Works only on SE or Mac II series; can't protect external floppy drive; port covers can be removed with scissors.

Company: Kensington Microware.

Requires: Mac SE or II series; hard drive;
System 6.0. List price: \$99.95.



A good security product has to strike a delicate balance: it must protect the computer

without making access a hassle for legitimate users. After all, if you seal your Mac in a block of cement, your security problems are over.

Kensington's PassProof is a remarkably elegant combination of hardware and software for securing every route of access to the Mac. It won't stop a truly determined thief, but neither does it get in the way of everyday use.

Lock It Up

The best component of the PassProof kit is a well-engineered, Macintoshcolor key lock for the main floppy drive. Not only does the lock slip in quick as a wink, but the thing simply will not come out without the unique cylinder key. Bobby pins, paper clips, and prying utensils all fail to dislodge it without destroying the Mac's case. The lock has a satisfying, solid feel when you turn the key. The downside is this: you have to buy two PassProof kits if you have two internal floppy drives. And there's no PassProof component for an external floppy drive; if you own one, you'll have to disconnect it, or you'll defeat the whole point of using PassProof. (continues)



PassProof from Kensington Microware

The kit also includes flat steel plates that cover the floppy port and the SCSI port in the back of the Mac. Each is secured by a pair of screws that have abnormal heads, for which a special screwdriver (more like a deformed allen wrench) is included. These plates prevent people from getting bright ideas about attaching an external drive, thereby circumventing PassProof's other elements. There's an additional special screw for the Mac II cover, to prevent people from making off with your prized NuBus boards.

Software Padlock

PassProof's software is more complicated, but only slightly so. Once you've installed the Control Panel device in the System Folder, you enter a master password; you are now the Master User, with exclusive rights to change the program's options. Up to 255 other users can have access to the Mac itself, however, once you've given each a user name and a password. From now on, the software will demand a valid user name and password every time the Mac is turned on; both successful and unsuccessful attempts to sign in are neatly recorded in a log file.

The password policy is pretty strict: Uppercase and lowercase characters count; as you enter the password, you don't even see corresponding asterisks (because that would give away how long the password is); and you can require a series of sequential passwords, which must be entered in the correct sequenceand PassProof countenances no mistakes. The nice thing is that you, the Master User, never have to lie awake at night worrying what you'll do if you forget your password-because you hold the physical key to the floppy drive as well. If you forget your password, just start the Macintosh from an unprotected floppy and reinstall PassProof.

The PassProof software includes a tight, nicely done screen dimmer. If the Mac sits idle for x minutes (you decide), the screen goes dark, a moving icon bounces around the screen, and you must reenter your password to regain access. All this is optional; you can still choose between the security of the screen dimmer and the lush absurdity of After Dark's Flying Toasters.

Incidentally, it's not PassProof. It's PassProof™. Kensington puts that trademark on all four of the files PassProof puts in the System Folderand the software won't even run if you take ™ off an icon name. PassProof is not System 7-compatible (according to the company, by the time you read this, it will have a new version that will be compatible).

Leaving the Back Door Open

Alas, a complete security system is only as strong as its weakest link, and PassProof has one. It's those special screws for the SCSI and floppy ports. You can't turn them with a Phillips or normal screwdriver. You can, however, turn them with the blade of a pair of scissors. If somebody is really bound and determined to get into your Mac, and is armed with an external drive, PassProof isn't going to represent more than a ten-minute delay. But if you are concerned, Kensington will send you a set of redesigned screws that solve the problem, at no charge.

In the meantime PassProof's real value is the psychological hurdle it presents. Any casual or nonbloodthirsty thief is likely to be deterred just by glancing at the solid-looking floppy-drive lock. PassProof won't transform your Macintosh into a fortress-but it does create a sturdy checkpoint at the drawbridge.

-David Pogue

See Where to Buy for contact information.



Online Dictionary and Thesaurus

THE AMERICAN HERITAGE ELECTRONIC **DICTIONARY 1.0**

Pros: Complete word definitions: excellent dictionary search capabilities; recognizes misspelled words as well as any spelling checker does; clear, concise manual. Cons: No keyboard shortcuts; poor online help; weak thesaurus; numerous inconveniences and small design flaws. Company: The Writing Tool Group, a subsidiary of WordStar International. Requires: Mac Plus; System 6.0.2; hard drive with 3MB of free space. List price: \$99.



There are few writer's tools as important as a dictionary and a thesaurus. For writers

who use the Macintosh, on-line dictionaries, such as Spelling Coach Professional (Deneba) and Webster's Ninth New Collegiate Dictionary (Highlighted Data) on CD ROM, have been around for a while now, but sadly, all fall well short of the ideal. Electronic thesauruses, such as Word-Finder (Microlytics), Thunder 7 (Baseline Publishing), and Coach Professional, have also been available for some time, but they too fail to match the best printed thesauruses. I was thus cautiously hopeful when I received for review a new online dictionary and thesaurus, the American Heritage Electronic Dictionary, originally from Houghton Mifflin Software.

According to The Writing Tool Group, the dictionary portion of the American Heritage Electronic Dictionary contains the more than 116,000 definitions and 28,000 main entries of the American Heritage Dictionary, Office Edition; the thesaurus portion, Roget's II, contains synonyms for over 42,000 words. The entire program comprises a desk accessory (DA) and nine data files that occupy a hefty 3.1MB of disk space. Unfortunately, all nine files must be stored in the System Folder; you cannot place them in a folder of their own, either within the System Folder or anywhere else. (continues)

On MacAvenue, "Street Price" Means Great Value

We design quality into each of our products and services. Then we set the Street Price so you get the best deal. And since our price always includes support services and an extended warranty, you not only get the best price, you get the best value.



Quantum \$549

A Course in Maconomics...

Our MacAvenue line of hard drives, monochrome and color displays and modems gives you a value-priced alternative for Mac peripherals. Our hard drive is more than just another pretty case. Its metal interior and plastic exterior —

designed like the Mac's — control air flow and buffer the drive noise. But don't take our word for it. Ask Robert Wiggins, MacUser's longtime business columnist, who gives the MacAvenue drive his "highest recommendation." On top of that, MacUser magazine awarded our 40MB Quantum drive 4.5 mice. And to make your MacAvenue drive an even better value, we give you Now Utilities, a useful collection of a dozen productivity-enhancing programs, FREE!

Stop Scrolling Around

Scrolling up and down or waiting for your screen to refresh takes the joy out of graphic design. MacAvenue rescues you from the creative doldrums with a larger and sharper image of your whole design. No scrolling!

MacAvenue Display systems are value leaders in largeformat Macintosh displays. Sharp screen images, flickerfree refresh rates and convenient ergonomic features such as tilt-swivel base make our displays comparable to competitors' products that often cost double. But there's more! With each MacAvenue Display, you'll receive Now Utilities and the After Dark screensaver package; a \$259 software value that's yours FREE!

No Guesswork

Our engineers evaluate every product we sell to make sure it performs to exacting standards. If you do have a question, just make a toll-free call to our technical support staff. They'll usually have you up and running smoothly in a few minutes. What's the bottom line? There are no worries with MacAvenue software and hardware — It's guaranteed.



Protegé Hard Drives

Capacity	Ext	External		Internal		
	Seagate	Quantum	Seagate	Quantum		
40+MB	\$395	n/a	\$289	n/a		
50+MB	n/a	\$449	n/a	\$329		
100+MB	n/a	\$639	n/a	\$549		
200+MB	n/a	\$959	n/a	\$839		
Carrying C	ase		2690	8 \$24		

Protegé Displays

Protegé Full-page Display	
With Video Card22013	\$495
Protegé Dual-page Display	
With Video Card22017	\$879

Includes cards for Macintosh SE, SE/30, Mac II, Classic, LC, or Ilsi

Call 800-926-6221 Key Code 871



A Division of CompuAdd Corporation 12303 Technology Boulevard, Austin, Texas 78727





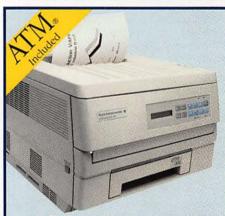
Overnight for \$3





PhoneNET Din-8 to RJ11, 10pk	22524	
	22334	\$215
PhoneNET StarConnector™ 10pk		\$129
PhoneNET StarController		\$898
Global Village		
Teleport Modem	22311	\$135
Teleport/Fax 9600	22314	\$185
Interex		
LocalTalk connector Din-8 to Din-3	22521	\$32
MacAvenue		
Protegé 2400 External w/ Software	22315	\$99
Protegé 2400/SendFax 9600 w/ Softwa		\$119
Protegé V.42bis external, w/ software		\$189
Microcom		27.015/6
MacModem V.32/9600	22318	\$452
OutRound		0.403.000
Pocket Port Modem	22319	\$259
Shiva		
FastPath 5 Gateway	22552	\$1969
NetBridge		\$399
NetSerial X232		\$275
TeleBridge		\$409
Technology Works		
Mac II/10t Ethernet Kit	22540	\$275





Enhanced microLaser

Texas Instruments has added 16 page-perminute printing speed to their popular line of microLasers, the printer that was awarded 4½ mice from *MacUser*. The microLaser XL offers the same quality output as the original microLaser and it offers added upgrade flexibility. Bundled with Adobe Type Manager.

TI microLaser XI

35 font w/ AppleTalk	22859	\$2989
17 font w/ AppleTalk		
I microLaser		

35 font w/ AppleTalk22851 \$1689 17 font w/ AppleTalk22856 \$1389

STORAGE DEVICES		
Applied Engineering	2.722.2	Water 212
High-Density 3.5" 1.44K Floppy Drive	24736	\$229
Chinon		
CD-ROM External Drive 350ms	24397	\$549
Cutting Edge		
800K Floppy Drive		\$119
Syquest Removable w/ Cartridge &SW	24401	\$597
Dayna Communications		
DaynaFile 360K DF0100	24738	\$689
DaynaFile 360K/1.2MB DF0102		\$839
DaynaFile 360K/1.44MB DF0104	24737	\$839
lomega		
Bernoulli Dual 44MB	24384	\$1799
TransPortable 44MB		
Irwin Magnetics		
External Tape Back-Up 5080/120	23833	\$719
MacAvenue		
HD Carrying Case	26908	\$24
NEC		
CD-ROM Reader CDR-36 w/o I/F	24636	\$430
CD-ROM Reader CDR-73 w/o I/F		\$634
PLI		
TurboFloppy 1.4	24741	\$359
Ouantum		
Protegé 105MB LPS External	24399	\$639
Protegé 210MB External		\$959
Protegé 52MB LPS External		\$449

PRINTERS, SCANNERS AND FAXES

_	
Epson	
	6
FS-300C Color Scanner w/ I/F	22765 \$182
FN-3000 Color Scanner W/ I/F	22765 \$1824



Kodak	
M150 Mac Portable22855	\$399
MicroTek-IMSI	
Microtek 300Z Color Scanner22755	\$1929
Orchid	
OrchidFAX Modem22702	\$485
Relisys	
Tefax RA211022700	\$895
Seiko	
Label Printer22852	\$189
Texas Instruments	
microLaser Toner Cartidge38311	\$46
Umax	
Umax Color Scanner22768	\$1589



Save money on a high-end fax. The DoveFAX operates at 9600 baud for fax and 2400 baud for data. Redials, schedules multiple fax transmissions and automatically receives incoming calls in the background.

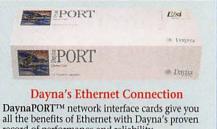
DoveFax22701 \$297

COMMUNICATIONS

Applied Engineering	
DataLink/Mac Portable22308	\$209
Asanté	
MacCon+ 30iE thk/thn22526	\$272
MacCon+ IIE thk/thn22538	\$269
MacCon+ IIET thk/UTP22529	\$272
MacCon+ SEE thk/thn22525	\$272
Dayna Communications	
DaynaPORT E/3022544	\$299
DaynaPORT E/II-T22547	\$299
DaynaPORT E/LC22548	\$359
DaynaPORT E/SE-T22543	\$299
DaynaPORT E/si-T22551	\$299
EtherPrint22541	\$349
Farallon Computing	
PhoneNET Connector Din-822513	\$31



Customer Service Is Our Most Important Product



record of performance and reliability.

DaynaPORT E/SE22542	\$285	
DaynaPORT E/30-T22545	\$285	
DaynaPORT E/II22546	\$285	
DaynaPORT E/LC-T22549	\$285	
DaynaPORT E/IIsi-T22550	\$285	

MONITORS AND VIDEO CARDS

Micron	
SE/30 8-Bit 640X48023541	\$345
Radius	
Pivot II Interface23572	\$319
Pivot LC Interface23571	\$319
Pivot SE/30 Interface23570	\$319
Radius Pivot Display22028	\$725
RasterOps	
Grey Scale 19" monitor GS for Mac II22007	\$1614
RasterOps 24L23555	\$2995
Seiko & RasterOps	
14" Trinitron w/ RasterOps 24SI Card22030	\$989
20" Trinitron w/ RasterOps 24L Card22026	\$4995
20" Trinitron w/ RasterOps 8L Card22025	\$3599
Sigma Designs	
L-View Multi-Mode 19" w/ Mac II adapter .22008	\$1449
SilverView 21" w/ Mac II adapter22104	\$1499
SilverView 21" w/ SE/30 adapter22103	\$1499

PERFORMANCE UPGRADE BOARDS

40MHz PowerCache Ilci w Coprocessor 23651 \$1167

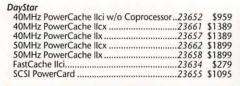


Top Printer Value

Get ImageWriter compatibility at a significant savings. The Seikosha Personal Printer SL 2000 AP is a hard-working, full-featured impact printer that gives you NLQ performance for documents and graphics.

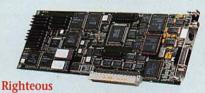
Seikosha Personal Printer

SL2000 AP22857 \$235



MEMORY EXPANSION

MicroTech International		
1MB Module for Mac Classic	25493	\$79
echnology Works		
2 X 4MB Module for Mac LC	25492	\$469
4 X 1MB SIMM FX	25484	\$209
4 X 4MB II/IIx SIMM Kit	25490	\$899
4 X 4MB IIfx SIMM Kit		\$899



Color from RasterOps

Add a RasterOps 24STV board to your system and you'll be sure you're on the cutting edge of color technology. The 24STV offers the realism of 24-bit color as well as the power to display and digitize live video in a moveable and resizable window on vour Mac screen.

KEYBOARDS, MICE, ETC.

Advanced Gravis	
ADB Mousestick25286	\$62
ADB SuperMouse25289	\$94
DataDesk	
Mac 101E Keyboard25187	\$129
SWITCHBALL25183	\$98
SWITCHBOARD25182	\$159
Kensington	
Turbo Mouse ADB25281	\$110
Turbo Mouse Plus25280	\$110
MacAvenue	
101 Extended Keyboard ADB25186	\$99
MicroSpeed	
MacTrac (SE, II, Ilgs)25285	\$73
Mouse Systems	
Little Mouse25283	\$75
Seiko	
DT3600 Digitizing Tablet23734	\$295

ACCESSORIES

3M	
3.5" Diskettes DS, DD Formatted 10Pk25880	\$13
3.5" Diskettes DS, HD Formatted 10Pk25881	\$25
American Power	
UPS 110SE26292	\$207



Unforgettable Deal on Technology Works Memory! -

Don't forget to maximize your Macintosh with MacAvenue's memory bargains. Only the best surface-mounted 80 nanosecond memory products. Call for further pricing information.

2 x 1MB SIMM Kit, 80ns25480	\$98	
4 x 1MB SIMM Kit, 80ns25482		
3MB Upgrade Kit for		
Mac Portable25486	\$895	
IIci Cache Card w/64K23648	\$239	
The second control of		

All Technology Works products come with a lifetime warranty!



Nuvo Ethernet Performance

NuvoLink SC makes the SCSI to Ethernet connection simple, whether you have thick cable, thin cable or twisted pair wiring. Enjoy the benefits of enhanced network performance - faster E-mail and file transfers — immediately.

NuvoLink SC......22535 \$369



Seiko and RasterOps Display **Options**

Seiko/Trinitron Quality at MacAvenue Value

14" Seiko w/o Video Card22002	\$589
14" Seiko w/RasterOps 24Si22030	\$1229
20" Seiko w/o Video Card22009	\$2145
20" Seiko w/RasterOps 8L22025	\$3599
Seiko Label Printer22852	

Applied Engineering	
QuadraLink	\$205
InnovativeTechnology	20000
The Library (black)26905	\$14
The Library (grey)26903	\$14
Kensington	
Apple RGB Anti-Glare Filter26891	\$64
Mac Classic Anti-Glare Clip-on Filter26924	\$53
System Saver Plus, Beige26888	\$64
Pace	
MacAvenue Carrying Case26898	\$65
MacAvenue Carrying Case Extended Kybd. 26901	\$79



Excel—lent Software from Microsoft

Microsoft Excel 3.0 is a pacesetter for Macintosh spreadsheets. Makes short work of complex proiects like market forecasting. Once you've got the fig-

ures together, Excel helps create a presentation that will sell your concept.

Microsoft Excel v3.0	30181	\$307
Microsoft Word v4.0	30582	\$245

	phisticated Circuits
25030 \$6	owerKey
	mmagráphics
26885 \$34	Bit Pad Plus

SOUND INTERFACES	
Articulate Systems	Total Control
Voice Navigator II23736	\$559
Farallon Computing	
MacRecorder23730	\$158
Passport Designs	
MIDI Interface23732	\$76





The Competitive Edge





Too Much Fun

No matter what kind of fun you might be in the mood for, MacAvenue's new Fun Pak II has just what you need! Take vour pick — from Apache Strike's fastpaced action to the calmer strategies of

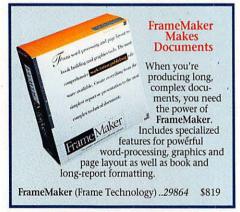
Shanghai. You'll be a winner every time! Also includes Solitaire Royale, Talking Moose and Dark Castle than \$200 worth of software for only \$49.95.

MacAvenue Fun Pak II29410

SATESTED.	IC ANID	DEIDLICHING
- WWELLIN	MC. AIMIT	PUBLISHING

Adobe	- 19
TypeManager v2.029825	\$64
Aldus	
PageMaker v4.029781	\$497
Claris	
Claris MacWrite II v1.130586	\$142
WordPerfect	
WordPerfect Mac v2.030591	\$298

BUSINESS SUFTWARE	
Acius	
4th Dimension v2.127780	\$485
Claris	
Claris FileMaker Pro27789	\$216
Claris MacProject II v2.529741	\$366
Microsoft	
Microsoft Office Bundle30182	\$525
Microsoft Works v2.030581	\$194
Nolo Press	
WillMaker v4.029888	\$37



COMMUNICATIONS

Freesoft	***
White Knight II27664	\$89
Prodigy Services	
Prodigy Startup Kit27726	\$27
Sitka	
MacTOPS Network Bundle27682	\$187

Addison-Wesley	
Stupid Mac Tricks28750	\$19
Broderbund Software	
SimCity v1.228678	\$29
SimEarth28764	\$45
Type! v1.0	\$18
Type! v1.0	\$29
Where in the World is Carmen Sandiego? 28672	\$29
Where in Time is Carmen San Diego?28774	\$29



Correct Grammar Guaranteed!

Correct Grammar catches 95% of your grammatical and spelling mistakes or your money back! And it not only snags split infinitives, misspellings and stylistic inconsistencies, it also suggests alternative

usage and explains the rule of grammar that applies. Awarded 4.5 Mice by MacUser.

\$49 Correct Grammar30633

MECC

ATTENDED AND A		04/2500
Number Munchers	28034	\$29
Word Munchers	28036	\$29
Simon & Schuster		
Typing Tutor	28008	\$28
Spectrum Holobyte		
Tetris	28606	\$25
Ventana Press		
The System 7 Book	27512\$	19.95

THE GRAPHIC ARTS		
Adobe		
Illustrator v3.0	29789	\$378
Photoshop v1.0.7	29266	\$543
Aldus		
FreeHand v3.0	29785	\$388
Persuasion v2.0	29782	\$327
Broderbund Software		
Print Shop v1.3.1	29836	\$35
Claris		
Claric MacDraw II v1 1	20204	\$290

Claris MacDraw Pro v1.029205

At MacAvenue we are committed to giving you the

.29232 \$188

Three Great Reasons to Choose **MacAvenue**

30-Day Money-Back Guarantee Every hardware product and every

office accessory MacAvenue sells will give complete satisfaction. If not, return it in the original packaging within 30 days of purchase for a full refund. Consumable items, opened software, videotapes and shipping costs are not refundable.

> **Toll-Free Technical Support** If you experience a problem with anything you purchase from MacAvenue, call our product support staff at 800-766-6221 weekdays from

8:00 am to 7:00 pm, CST. We can usually resolve your technical problems over the phone.

> **Extended Limited Warranty** For up to 120 days after your purchase, MacAvenue will replace or repair (at our option and without cost to you) any product with which

you are not completely satisfied. Call us for a Return Material Authorization (RMA) number. When you have the RMA number, ship the product to us, freight and insurance prepaid. We will pay the freight charges back to you (during the warranty period).

Macromind	
Macromind Accelerator29258	\$124
Macromind Director v2.029217	\$638
Microsoft	
PowerPoint v2.0129798	\$246

SAFETY, MAINTENANCE, REPAIR UTILITIES	
Adobe	
Adobe Type On Call30560	\$47
Berkley Systems	
After Dark v2.030425	\$24
Central Point	
Mac Tools Deluxe v1.0130365	\$79
Dayna Communications	
DOS Mounter v2.030471	\$65
Fifth Generation	
SuperLaser Spool v2.0230388	\$92
GDΤ	
ParaLink Express30548	\$99
PrintLink Collection (Serial) v4.030448	\$58
Microcom	
Virex30413	\$59

Call now for a FREE catalog! 800-926-622



A Division of CompuAdd Corporation

affordable, reliable Macintosh products you want, when you want them. Orders placed by 8:00 pm CST Monday through Thursday for in-stock

- items ship the same day with a \$3 overnight delivery charge for orders weighing 20 lbs. or less. Saturday delivery is available for an additional
- For your convenience, we accept VISA, MasterCard, Discover and American Express — no surcharge will be added. And your account will not be charged until we ship your order.
- For COD orders, add \$8.
- For information about leasing and corporate or institutional purchase orders, call 800-888-6221.

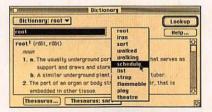
Ideally, the American Heritage Electronic Dictionary would open automatically, the way Thunder 7 does, in selected applications (such as your word processor)-but it doesn't. Instead, you must manually select the DA each time you want to launch the program. Ideally, the DA would add its menu (entitled AHED) to the currently active application the way Coach Professional does, but this occurs only if the Finder is turned on. If MultiFinder is turned on, the AHED menu is added to the separate, and much less convenient, DA layer. (If you use a trick not mentioned in the manual-pressing the option key when selecting the DA-the AHED menu will be added to the current application's menu bar.) Even less conveniently, the application whose menu bar contains the AHED menu must be stored on the start-up volume; if it's stored anywhere else (in a different hard drive partition, for example, or on another drive), the dictionary refuses to run.

Another disadvantage is that it cannot, at the press of a key, search for a word you've selected in a document the way Coach Professional does. To look up a word or search for a synonym, you must open the appropriate window with a command from the AHED menu and either type in the word manually or paste it in from the document. No keyboard shortcuts are provided, and there's no way to add them.

In most instances, the dictionary locates and displays one or more definitions in the dictionary window's scroll box after a short pause. (When I tested this software, the entire program slowed to a crawl on rare occasions; quitting and relaunching always solved the problem, however.) The lookup function has no trouble recognizing plural nouns and verb forms other than the infinitive, and if you misspell the word you're looking for, it displays a list of properly spelled alternatives. Unlike Webster's Ninth New Collegiate Dictionary, American Heritage is as intelligent as the best spelling checkers when faced with such mistakes as missing first letters (such as onnection instead of connection), phonetic substitutions (flegmatic instead of phlegmatic), and reversed letters (aptriotic instead of patriotic).

By and large, the definitions are more complete than those in Coach Professional, and they include pronunciation, hyphenation, parts of speech, inflections (different forms for number, tense, and so on), etymology, and occasional usage notes. Unlike Webster's Ninth New Collegiate Dictionary on CD ROM, the American Heritage Electronic Dictionary has no illustrations or spoken pronunciations. Conveniently, you can look up the definition of any word within a definition simply by double-clicking on it. Not so conveniently, you can copy only one word at a time from a definition to a document. (In Coach Professional, you can copy any part of a definition. In Webster's Ninth New Collegiate Dictionary, you must copy the entire definition; a copyright notice is added automatically.)

When it looks up a word, the dictionary searches only the head words, those found at the start of each main entry. A special SearchText command unique to this program, however, searches the entire dictionary to locate entries containing a specified word or, using the command's Boolean functions, combination of words. For example, SearchText can find all words based on a specific Latin root. And it can generate a list of Greek gods (plus a few other stray words) by searching for Greek and god. SearchText also works well as a kind of reverse dictionary; if you can't remember the word for the study of insects, for example, SearchText can



Too Many Menus In addition to the list of windows at the bottom of the American Heritage Electronic Dictionary menu, two pop-up menus in the dictionary window list open dictionary and thesaurus windows separately, while a third provides access to up to 16 previously looked-up words (as in the open menu here). A less confusing, more economical design would easily combine everything in a single menu.

ferret out entries containing both study and insects, and thus find entomology. A variety of special search symbols enable you to narrow a search to a certain part of speech, a geographic region, a type of usage (such as slang or archaic forms), and so on.

The thesaurus window-reached by means of a menu command or a button in the dictionary window-is almost identical to and just as cluttered as the dictionary window (see "Too Many Menus"). Thesaurus entries are sorted by meaning and, unlike those in Coach Professional, always display the appropriately inflected forms (if the noun you enter is plural, for example, all the synonyms are plural). The thesaurus does not recognize misspelled words (you'll need to switch to the dictionary for that) and, as with the print edition of Roget's II, it lists only close synonyms (no distant synonyms, related words, or antonyms). Also in contrast to the more comprehensive Roget's International Thesaurus (my favorite thesaurus, currently available only in book form) and Coach Professional, the electronic Roget's II has a rather restricted word list, and it lacks synonyms for such commonplace words as theater and patriot, for example.

The American Heritage Electronic Dictionary contains several unusual features in addition to the dictionary and thesaurus. Its Wildcard command locates all words that contain a specified string of known letters and either a fixed or indeterminate number of unknown letters. For example, crossword-puzzle players can find a fiveletter word that begins with b and ends with tz, and songwriters can find words of any length that rhyme with bappily. The Anagram command generates a list of words that contain the same letters as the word you specify; if you enter sport, for example, Anagram returns with ports and strop. If the Wildcard or Anagram window lists a word you don't know, a double-click will reveal its definition.

Clearly, the American Heritage Electronic Dictionary has many minor irritants and small flaws and the thesaurus and online help are also of (continues) relatively poor quality. On the other hand, this program contains the best online dictionary currently available for the Macintosh. Its searching ability is unequalled, its ability to recognize misspelled words is excellent, and its Wildcard and Anagram functions are nice bonuses. The priceless than half that of Webster's or Coach Professional-is also right. All told, I judge the American Heritage Electronic Dictionary a winner, but only by a technical knockout. The Writing Tool Group will have to revise the program and eliminate its many shortcomings if it wants to really KO the competition.—Robert C. Eckhardt

Font-Customization and Format-Conversion Utility

See Where to Buy for contact information.

FONTMONGER 1.0.3

Pros: Excellent interface and help system;
nifty features like built-in alterations
and extensive customization options; very
good technical support. Cons: PostScript-to-TrueType conversion can be uneven due to inherent problems
with TrueType-PostScript compatibility,
especially with word processors.
Company: Ares Software Corporation.
Requires: Mac Plus; second disk
drive; System 6.0.2. Recommended: Hard
drive. List price: Version 1.0.4 \$99.95.

FontMonger was the first product released in response to the introduction of True-Type as Apple's alternative to the PostScript font format. The ease with which FontMonger batch-converts between PostScript Types 1 and 3 and TrueType is in itself a masterly stroke.

FontMonger's font-format conversion, while adequate in performance and impressive in terms of letter-curve-fitting, is a victim of the bugs and problems endemic to any new industry standard. The integration of competing font formats in Macintosh desktop publishing is far from seamless. You cannot convert fonts from PostScript to TrueType without encountering problems ranging from slight variations in leading and character widths to actual font substitution. The former is due to

problems with TrueType technology itself, while the latter is a function of the way certain applications use font ID numbers rather than names. (At press time, Ares Software was betatesting a new version of FontMonger that the company claims will actively and accurately address these problems of incompatibility.)

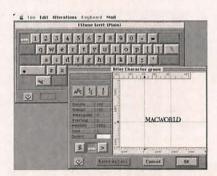
Despite these problems, Font-Monger would be a bargain at twice the price. Its extensive font-customization tools, combined with an elegant and easy-to-learn interface, bring powerful typographer's tools to the desktop.

FontMonger's Alterations menu offers built-in changes, such as Small Caps, Slant, Superior, and Inferior. With these you can easily choose all or a range of characters within a font to create a small-caps typeface, an italic typeface for a font that does not have one, or subscript and superscript numbers. These alterations can also be combined to create new typefaces, such as a Slanted (or italicized) Small Caps typeface.

I've Grown Customized to Your Typeface

Double-clicking on any character in FontMonger's Key Caps-like display brings up a FontMonger character dialog box, which includes a Composites panel designed to help you automatically create composite characters such as horizontal and vertical fractions (that is, ½ and ½).

The Composite button to the left of the fraction buttons allows optimum customization; you can create a composite of any number of characters, in any number of fonts, and with



Macworld's Logo It was incredibly simple to import the Macworld logo as an EPS file into the Stone Serif typeface. Now placing the logo is as easy as pressing the grave-accent key on the keyboard in that typeface.

any number of symbols, limited only by what you consider good taste. Characters or composites of characters can also be mapped to custom key combinations.

The Readouts panel provides control of width and height (what percent the character is scaled from its original size), horizontal and vertical distances (how far a character is moved up or down by 1/1000 point), slant (the number of degrees a character is obliqued, or italicized), and letterspacing.

The last box on the Readouts panel is even more helpful: the Context box allows you to type in letters that are placed before and after the character you select, so you can evaluate how you've changed or created a character in relationship to adjacent characters.

FontMonger does not limit you to characters within a single typeface or even to typefaces themselves. Open up any number of fonts and cut and paste characters between the keyboards—kind of like cross-font pollination.

You can also create your own symbols and save them as EPS or PICT files and import them into your commonly used font. It was easy and straightforward to incorporate some common *Macworld* symbols, like the end box (a), directly into the font used for *Macworld*'s body text.

It's the Little Things that Count

Little touches make FontMonger's interface impressive. If a font is installed or in use, FontMonger makes a copy of the font you need to work on. And the System 6.0.X context-sensitive help messages rival or surpass System 7's balloon help.

It will be some time before users can extensively test and retest format conversion using the numerous configurations and seemingly limitless number of fonts in the Mac world—as I noted, a number of problems have resulted from the immaturity of TrueType technology. But Font-Monger is much more than a conversion utility. Its font-manipulation capabilities and easy-to-use interface make its \$99.95 price a real steal for desktop publishers at every level.

-Luis Camus

See Where to Buy for contact information.

Outscanning in its field. 800 dpi, and more.

Our new 8000/CLX 800 dpi flatbed scanner tops anything else out there in every way but price. In addition to high resolution, you get the added value of the industry's most sophisticated enhancements. And you can get it all in a sleek, quiet, easy-to-operate machine for the PC,PS/2, and Macintosh.

Or, if you're looking for a hand-held scanner, our new AVR 1000 scans a full 81/2" wide, and comes with a 10-sheet document feeder for hands-free operation.

And any AVR model you choose — 400, 600 and 800 dpi, black & white, 8-bit grayscale (field upgradable to color) and 24-bit color — comes with our exclusive ScanPack™ bundle: top image editing software (like Photoshop™or Picture Publisher™); image sharpeners; our EasyScan™ utility so you can scan from within any application. And for Macintosh, a hardware accelerator option and JPEG data compression up to 80:1.

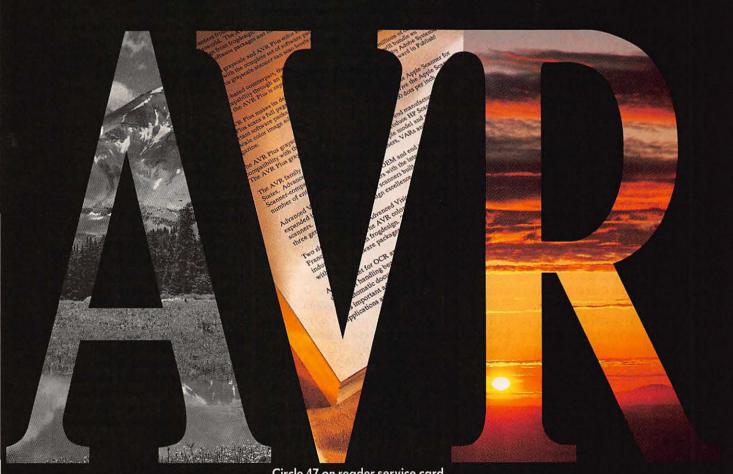
Plus, emulation of both HP Scanjet Plus and Apple scanners so you can use more application software. In fact, nearly any application software.

To find out more about our new AVR 8000/CLX, AVR 1000, and AVR's complete line of affordable scanners, ask your reseller or call 800-54-IMAGE or 408-434-1115.



Advanced Vision Research

© 1991, Advanced Vision Research, Inc. Easy Scan and ScanPack are trademarks of Advanced Vision Research, Inc. Other TMs or ®s are trademarks or registered trademarks of their respective holders. All specifications subject to change without notice.



Circle 47 on reader service card



24-bit Video-Image Capture Boards

COLORSNAP 32+

Pros: Quick to digitize; feature-packed software; high-quality images.

Cons: Abysmal manual; poorly designed interface; displays only one image at a time. Company: Computer Friends.

Requires: Mac II; 4MB of RAM; hard drive; 8- or 24-bit color video board, external video device. Recommended: 8MB of RAM. List price: \$995.

OUICKIMAGE 24

Pros: Easy to use; high-quality images; excellent manual; low price.

Cons: Strange, nonstandard interface; no color-correction features; slow to digitize. Company: Mass Microsystems.

Requires: Mac II; 4MB of RAM; hard drive; System 6.0.5; external video input device; cables. Recommended: 8MB of RAM. List price: \$695.



Wow, is desktop video taking its sweet time to arrive. Even a task as simple as capturing a single frame of moving video onto your screen requires a NuBus

board costing nearly \$1000. The shortcomings of recent entries, the ColorSnap 32+ and the QuickImage 24, illustrate how difficult creating such a product must be.

Hooking Up

The first thing you do is slip one of these NuBus boards into the Mac. With its two large, sandwiched circuit boards, the ColorSnap can be a tight squeeze; you may have to make sure it's positioned at the end of your row of NuBus slots.

Next you plug a videocassette recorder, camcorder, or still-video camera (like the Canon XapShot) into the jacks on the exposed end of the board. You can hook up regular TV signals (NTSC composite) or S-VHS signals to either board; the Color-Snap also has a jack for RGB (computer monitor) signals, and comes with cables. You have to provide your own cables in order to use the Quick-Image, but you can connect two devices at once and switch between the input signals from within the Quick-Image program.

Now you copy the controller program to the hard drive (the Quick-Image also requires an INIT), run it, and turn on the VCR or camera. You see the incoming video picture, in gray or color, in a 2-inch-square preview window. The ColorSnap updates this display slowly—perhaps twice per second; the QuickImage, on the other hand, shows the video in full real-time motion, so it's much easier to choose your moment of capture.

At the instant you see the frame you want to capture, you click on the Capture button. You lose control of the Mac for about three seconds (ColorSnap) or ten seconds (Quick-Image) while the computer processes that fraction-of-a-second image. Then, suddenly, a gloriously clear window appears, containing an impressive fullcolor digitization of the video frame you wanted, filling the screen of the Apple 13-inch color monitor. You can save the image in a PICT or TIFF file of any color depth (ranging from black and white to 16 million colors). The QuickImage also has some special-effects filters, but they generally succeed only in mucking up the image.

Both packages, incidentally, come with a plug-in module so that you can capture video directly into Adobe Photoshop. The ColorSnap includes similar modules for QuarkXPress and ColorStudio.

Interface in Your Face

Beyond this basic similarity in function, the experience of using these two packages is utterly different. For some reason, both manufacturers decided to jettison the standard Macintosh interface. The QuickImage interface has some weird, Next-like square buttons that don't convey nearly as much information as Mac buttons. For instance, because they are identical rectangles, there's no default (highlighted) button. And because of their color scheme, these mutant buttons are never dimmed. You sometimes wind up repeatedly clicking on something that's actually disabled (since you have no visual clue). There are other oddities in the OuickImage software. too; toggle switches-controls where you're asked to choose one of two



Open a Window QuickImage, unlike its rival, permits multiple image windows (in addition to the Preview window, upper right). Not only can you compare takes, but you can apply special-effects filters to specific regions of specific windows, as in the monochrome window at lower right. Note the not-very-intuitive control panel, though (far right): try to guess what the icons do.



Rogue's Gallery The ColorSnap software includes what could be a very handy feature for cataloging the images you create: the Gallery. When you double-click on one of these thumbnail sketches, the program locates the corresponding PICT or TIFF file on the hard drive and, after a moment, displays it in a window at full size. It's buggy, though.

options—are handled inconsistently within the program.

But count your blessings: at least the software is *structured* simply and intuitively; at least you always know where you're going and what's happening. And the manual is terrific.

The ColorSnap software, on the other hand, is a sprawling landscape of oddly implemented features. Its Gallery feature in particular—a potentially useful keyword-searchable image database—is filled with software design errors. Choose a menu item, and nothing happens. Two consecutive menu commands bring up the exact same dialog box. And there's no Window menu, so it's entirely possible for a small window (such as the Gallery) to get permanently lost behind a larger one, making you save and close (continues)

ONE SIMPLE DECISION, EIGHT GREAT APPLICATIONS.

INTRODUCING GREATWORKS™FOR THE MACINTOSH.

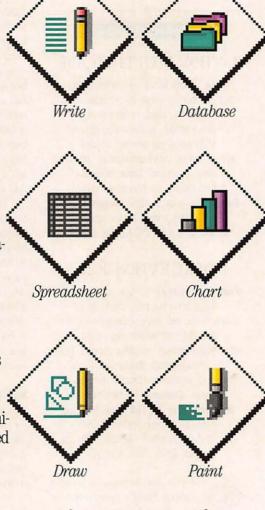
With just one decision, you can get all the Macintosh software you need to get started.

That's because we've combined eight of the most popular applications into one fully-integrated program.

Priced at \$299,* GreatWorks offers the ultimate in performance and affordability.

It includes separate modules for word processing, database, spreadsheet, charting, drawing, painting, outlining and communications—all of which are accessed through a consistent interface and supported by an extensive HyperCard Help system.

Each module is a complete application filled with the kinds of advanced features found in stand-alone programs. Those features include sophisticated database forms generation, multiple column word processing documents, more than 60



combination chart types, support for 256 colors, a 100,000-word spelling dictionary and a 660,000word thesaurus.

All of which means GreatWorks is perfectly suited for a wide variety of jobs.

And since it requires only one megabyte of memory and fully supports System 7, GreatWorks makes the most of any new Macintosh—from a Classic on up.

So see your dealer for your copy of GreatWorks. Or call us at 1-800-228-4122, Ext. 815G for more information.

Because, if you're looking for Macintosh software, it doesn't get any simpler than this.



SYMANTEC.

Circle 154 on reader service card

Communications

Outline

the larger one just to view what's behind it.

No Manual Transmission

But at least somebody probably looked over the ColorSnap's software before shipping it; that's clearly not the case with its manual. The typos are one thing—that, for some unhappy reason, is par for the course in Macintosh manuals-but this manual goes far beyond. It refers to commands that don't exist. Paragraphs end mysteriously in midsentence. Illustrations don't match the screen. After a few pages of this, you stop trusting it—and you get angry. On a piece of publicdomain software you could forgive this slapped-together effect, but not on something that set you back a thousand bucks.

There are trade-offs everywhere in the feature sets of these two packages. ColorSnap takes far less time to capture the image, but QuickImage lets you have more than one image on the screen at a time, so you can compare takes. ColorSnap has its Gallery but doesn't let you select just a portion of the image to copy or save (Quick-Image offers a standard selection marquee). Both companies have one or two excellent technical-support staffers; both can sometimes be hard to reach (although Mass Micro's number is toll-free). The QuickImage has a multiple-exposures feature that snaps the shutter several times in succession (at a rate you specify), creating an image each time—theoretically, a great feature for animators. Trouble is, the QuickImage takes ten seconds to shoot a frame (even if you tell the program to take them, say, every two or five seconds)-and what's the use of snapshots taken that far apart?

On the other hand, the Quick-Image lets you have multiple open windows. In other words, you have the luxury of comparing successive attempts at capturing an image, by viewing all of them on the screen at once. Or you might open several windows containing the same image—one color, one black-and-white, one dithered, and so on—as you hunt for just the right effect.

The QuickImage is clearly the welldocumented, more carefully designed and reliable product; the fact that it is \$300 cheaper than the ColorSnap and comes bundled with a stripped-down version of Photoshop only makes it more attractive. The ColorSnap's feature list is longer, and the actual digitizing process is much faster. But nobody should be subjected to the unpolished software and almost insultingly slapdash manual. Neither manufacturer has quite mastered the Macintosh interface, but the maker of the QuickImage has at least mastered the art of quality control.

—David Pogue

See Where to Buy for contact information.



Multiple-Resolution Monitors

L-VIEW MULTI-MODE

Pros: Sharp focus; six resolutions; pop-up menus; large cursor and menu fonts; hot keys; screen saver; screen capture; online help; optional OCLI antiglare screen; tilt-and-swivel stand; power indicator; controls easy to access. Cons: Inflexible configuration; no gray-scale option.

Company: Sigma Designs. Requires: Mac SE. List price: Display system \$1999; with OCLI panel \$2299.

QUICKVIEW Z21

Pros: Four resolutions; gray-scale option; virtual screens; pan; zoom; large menu fonts; hot keys; screen saver; online help; tilt-and-swivel stand; chemically etched antiglare screen; flexible configuration. Cons: Soft focus; no power indicator; controls hard to access. Company: E-Machines.

Requires: Mac SE. List price: Mac SE

Requires: Mac SE. List price: Mac SE or SE/30 display system \$1995; Mac II display system \$2490; 1MB upgrade \$425 (Mac II only).



If you are impressed by the Radius Pivot's quick-change act—from landscape to por-

act—from landscape to portrait orientation with a flip—wait till you set your sights on the chameleon CRTs from Sigma Designs and E-Machines. The L-View Multi-Mode and the QuickView Z21 switch resolutions at the touch of a button, displaying tiny text one second and oversize icons the next. It's like having multiple monitors in a single box.

The Sigma Designs L-View Multi-Mode is a monochrome monitor with a 19-inch-diagonal picture tube that can display 120, 92, 72, 60, 46, or 36 dots per inch. The E-Machines QuickView Z21, on the other hand, measures 21 inches diagonally with resolutions of 80, 72, 40, and 36 dpi. If you add a 1MB memory-expansion kit to its video controller, the Quick-View is capable of displaying 8-bit graphics with up to 256 levels of gray.

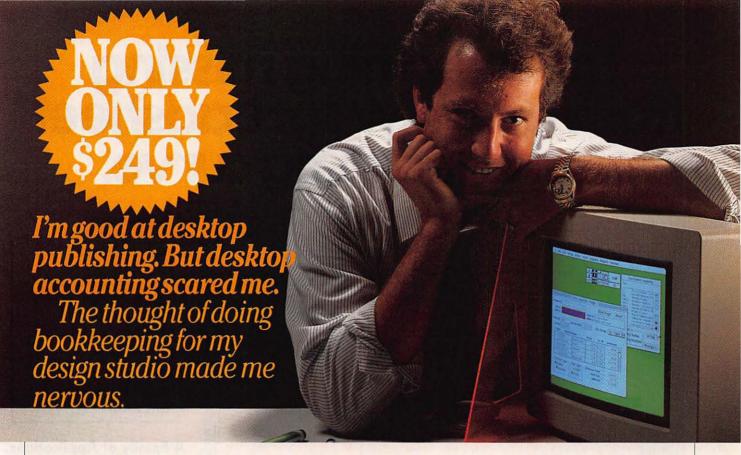
I tested both monitors on a Mac IIci, so installation was as easy as inserting the NuBus video controller, dropping some files into the System Folder, then restarting. Initial configuration is handled via special Control Panel devices (cdevs) provided with each monitor; thereafter you can change resolutions with user-specified hot keys. The L-View Multi-Mode cdev has a Next-like interface that makes it difficult to tell which options are enabled; standard check boxes would be better. The QuickView, in comparison, has separate and clearly marked controls for adjustments, configuration, and optional utilities.

Both monitors suffer from distracting jitters and pulsing if situated within a foot of another monitor, so be sure you have enough desk space to liberally separate displays. Furthermore, the L-View Multi-Mode must be situated to the right of any other monitors to avoid problems when switching resolutions. The QuickView is more flexible; it can go on either side and doesn't need to be the start-up or main screen, as does the L-View.

Multiple Resolution

Once properly configured, both monitors work exactly as advertised, allowing you to switch resolutions on the fly. Just press the appropriate hot key, and the screen is instantaneously redrawn at the new resolution.

A monitor's resolution determines how many discrete picture elements (pixels) the monitor can display in a given area, commonly measured in dpi. If WYSIWYG displays are important to you for desktop publishing, stick to 72 dpi; otherwise, use whatever resolution is best suited to the particular task at hand. At resolutions of less than 72 dpi, images appear (continues)



When I heard "balance sheet," I broke into a sweat. I know type, advertising, printing. Now I was forced to do our books.

No choice.

We were on our third part-time bookkeeper in eleven months, and she was called away suddenly. Sound familiar?

But I'm the boss and the buck stops with me. We had bills to pay, payroll checks to write, invoices to send, taxes to

set aside.

And deadbeats to collect fromonly I had no idea who owed us how much or for how long. Some suppliers may have even

thought of us as deadbeats. I needed to know our cash flow, and get a handle on all this. But I didn't have a lot of time.

Step one: find an accounting program that feels as familiar as our Macs, that starts out easy, but has lots of reserve fire-power for later on.

Ifound at Once! The manual looked orderly. I dug in...

The familiar with the unfamiliar

atOnce! starts you off with a tutorial that uses HyperCard, one of my old favorites. I was at home.

Circle 100 on reader service card

Numbers are my nemesis, but the tutorial was actually fun and got me comfortable. It takes you step by step through the program, and gives you some easy-to-swallow accounting basics so you're not reading a foreign language. There's context-sensitive help, just in case.

And while you learn, you can start to set up your books. So it doesn't come in a flash and you sweat a little. But you do it and you learn.

Istarted off light. Double-clicked on one of the default charts of accounts and my General Ledger was practically set up for me. Then entered a few client names in Accounts Receivable, to get an idea of what was coming in. Prepared six invoices—and atOnce! calculated sales tax. Nice. Printed the invoices which I redesigned in atOnce!—realign a field here, change a font there. The usual.

Then ran a Customer Aging Report to identify the slow-payers (I had no idea such a terrific thing was even possible).

MacWorld: 1990 and 1991 World Class Award MacUser: 1989 Editor's Choice Award and 4.5 mice

30 days free support

60-Day Money Back Guarantee if bought from Peachtree. Money back, minus \$25 re-stocking fee.

What I didn't know was costing my company

I discovered a key client who hadn't paid in two months. I called and collected and now he wants to know about atOnce! I wrote payroll checks for the staff, and sent our bank a balance

sheet I printed out myself-no sweat.

From fear and loathing to passion.
Now I even study the management reports at Oncel generates.

I'm still an art director. But at Once! helped me become a better businessman!

A hidden bonus made my day

When our bookkeeper returned, I showed her at Once! Now she even makes sure my plants are green. Putting the books on the Mac lets me take control.

Here's some free advice: Take control of your own business. Buy at Once!

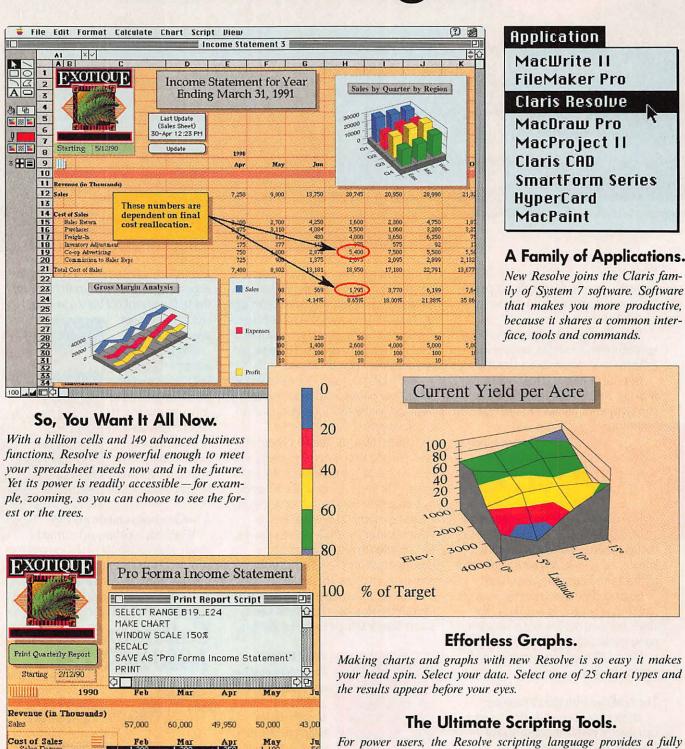
Call now to order 1-800 247-3224



Peachtree Software 1505 Pavilion Place Norcross GA 30093 404 564-5800

SYSTEM REQUIREMENTS: MACINTOSH PLUS OR ABOVE WITH AT LEAST 1 MB RAM, SYSTEM VERSION 6.0 OR HIGHER, HARD DISK AND ONE BOOK FLOPPY DRIVE. IMAGEWRITERGAND LASERWRITERGEPRINTERCOMPATIBLE. APPLESHARE: "AND TOPS SECOMPATIBLE. COPYRIGHT 1991 PEACHTREES OFFWARE, INC. ALL RIGHTS RESERVED. AT DONCE IS A REGISTERED TRADEMARK OF PEACHTREES FOFTWARE, INC. MACINTOSH, HYPECARD, IMAGEWRITER AND LASERWRITERAND LASERGISTERED TRADEMARKS AND APPLESHARE IS A TRADEMARK OF APPLE COMPUTER, INC. TOPS IS A REGISTERED TRADEMARK OF SUN MICROSYSTEMS, INC.

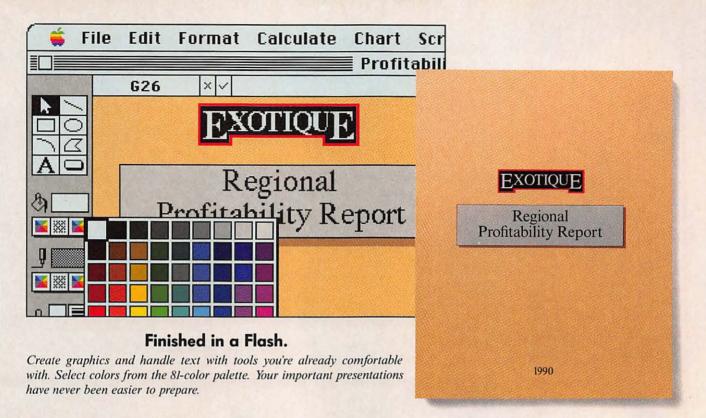
The only thing missing from our new spreadsheet is the learning curve.



900 200 5,400 3,600 structured development environment, to create ingenious, custom-

ized applications. For new users, Resolve automatically writes a script by recording your actions. One click on the assigned button

automatically triggers the script.



The System 7 Spreadsheet **■**

Introducing Claris Resolve.



A spreadsheet was never the sort of thing to inspire fantasies. But then along came the new Claris® Resolve™ spreadsheet.

For the first time, Resolve lets spreadsheet power flow to ps freely and intuitively. It utilizes

your fingertips freely and intuitively. It utilizes interfaces, tools and commands familiar to anyone who's ever used a Mac. Nothing comes between you and complete spreadsheet performance.

Resolve is packed with clever, interactive features that help people quickly get their footing. Like context-sensitive help. Automatic scripting. One-step charting. Instant zoom-in and zoom-out. Even a built-in spell checker.

But lurking just beneath the surface are enough tricks to inspire any power user. 149 built-in functions to help solve any business problem. 25 kinds of charts and graphs to excite the most jaded audience. Elegant, built-in database functions so you can swiftly access your data. And advanced analytical solutions to impress the math wizards.

Here's just one example of the outstanding design of Resolve. With Resolve, you can modify graphs directly in your spreadsheet. You don't have to switch back and forth between spreadsheet and chart modes. Think of the time savings. Not to mention the ease.

Yet, perhaps the most shining quality of Resolve is how it exploits System 7's most powerful functionalities – Publish & Subscribe and Inter-Application Communication. With Resolve, you can put charts in other documents and files and link them dynamically – so when you change any information in the spreadsheet, all the linked charts change as well. What's more, you can create hybrid solutions, like creating a HyperCard® program to access a database, send data to Resolve, and create and display a chart. All automatically.

New Resolve is the latest addition to the Claris family of software for System 7 – a new generation of applications that work together more simply, more powerfully, more gracefully than any software for the Macintosh ever has before.

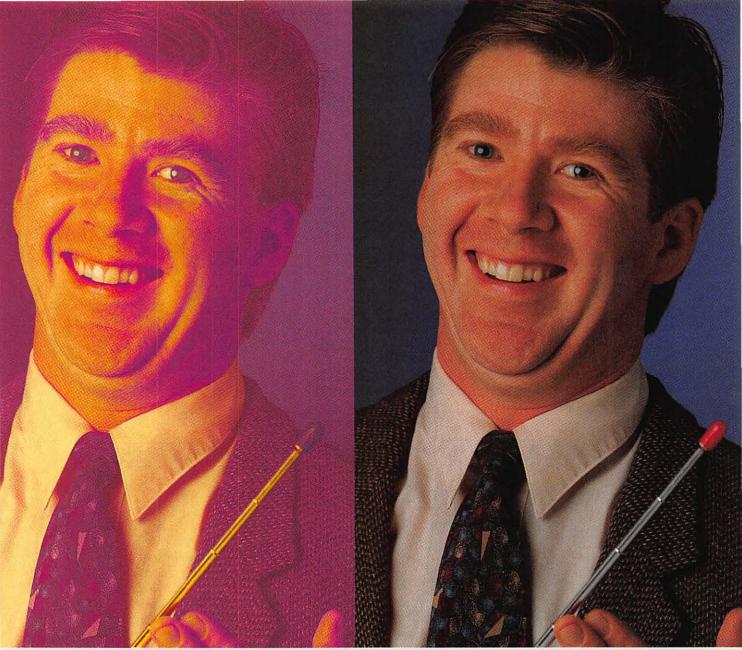
Special offer for owners of other spreadsheets* Get Claris Resolve for only \$99. Call 1-800-544-8554, ext. 98.



Simply powerful software.™

*Offer applies only to owners of Microsoft Excel, Lotus 1-2-3, Informix Wingz, and Ashton-Tate Full Impact. Offer good in U.S.A. only. Expires December 31, 1991.

© 1991 Claris Corporation. All rights reserved. For more information call 1-800-729-2292, ext. 30. In Canada, call 1-800-668-8948, ext. 48. Claris, FileMaker, MacPraint, MacProject, MacWrite and SmartForm are registered trademarks of Claris Corporation. Resolve and "Simply powerful software" are trademarks of Claris Corporation. HyperCard is a registered trademark of Apple Computer, Inc., licensed to Claris Corporation. Apple logo, Mac and Macintosh are registered trademarks of Apple Computer, Inc.



How the world sees you in Pseudo-Color

How the world sees you in Real-Color

Now you can afford to project a better image.

The portrait on the left reflects a pseudo-color LCD projection.

The portrait on the right reflects a real-color In Focus 1600LC LCD projection.

The difference in color is startling. The difference in price is just a few hundred dollars.

Which is almost nothing when you consider the impact the In Focus 1600LC creates in presentations.

Featuring the 16 most commonly used colors, the new In-Focus 1600LC gives your audience a dazzling view of

real color charts, graphs, rainbows and sunsets. With a resolution of 640 x 480.

In seconds, the 1600LC can be set on top of any ordinary overhead pro-

> The new In Focus 1600LC LCD

projection panel.

jector and connected to any color Macintosh or IBM compatible. It's that easy.

And the 1600LC is just one of a complete line of In Focus LCD projection panels ranging

from monochrome to 5000 colors with nearly photographic quality.

For more information or to arrange for a free demonstration, call

1-800-327-7231 or in Oregon, 503-692-4968.

And get the image you deserve.



© 1991 IN FOCUS SYSTEMS INC. 7770 SW Mohavek Street, Tualatin, Orrgon 97062, 1-800-327-7231. In Orrgon, 503-692-4968. Fax: 503-692-4476. In Focus, the In Focus logo and the In Focus 1000LC are registered trademarks of In Focus Systems, Inc. All other trademarks or registered trademarks are the property of their respective holders.

In Europe: Planetenweg 91, 2132HL Hoofddorp, The Netherlands Fax: 31-(0)-2503-24288

larger than normal, perfect for reducing eyestrain or giving a demo to a large group. Conversely, at higher resolutions everything is smaller, so, for example, you can cram more information on the screen in a spacious spreadsheet.

With the L-View Multi-Mode, when you switch among the six resolutions available, you also change the pixel dimensions of the monitor, from 1664 by 1200 pixels at 120 dpi, to 512 by 384 pixels at 36 dpi (the dimensions of the original 9-inch Mac screen). This is significant because applications rely on pixel dimensions to determine where to place screen elements such as dialog boxes and windows. Therefore you should launch applications only after you set the monitor to the resolution at which you intend to work; otherwise, alert boxes may appear off-screen, beyond the cursor's reach. With MultiFinder, of course, you can have a spreadsheet open at 120 dpi, then switch to HyperCard and change the resolution to 36 dpi. Just avoid switching resolutions within applications.

With the QuickView, the monitor's pixel dimensions are locked in at start-up based on your choice in the Control Panel. Changing resolutions has no effect on pixel dimensions. The picture simply zooms in or out, depending on whether you switch to a lower or higher resolution, respectively. When you zoom in, only a portion of the total picture is visible. To see the rest, you pan around by simply moving the pointer to the edge of the screen, then the area just beyond the bezel slides smoothly into view.

Pan and zoom work especially well with the QuickView's unique Virtual

Desktop feature, which allows you to specify pixel dimensions greater than the physical screen. Basically, memory on the controller is used to simulate a screen too large to be displayed all at once (up to 10,240 by 960 pixels with the optional memory kit). But by panning, you can view different portions of the virtual desktop. (Conceptually Virtual Desktop is similar to Berkeley Systems' Stepping Out II, a utility that creates virtual desktops on any monitor, but which is considerably slower because it's implemented in software.) So that you don't lose your bearings on really big desktops, the menu bar can be locked to the top of the screen, dialog boxes can be automatically centered in the physical screen, and the panning feature can be turned off temporarily.

The 21-inch QuickView has the ability to display a maximum of 1,228,800 pixels (1280 by 960). In its 120-dpi mode, the 19-inch L-View Multi-Mode displays over 60 percent more information—1,996,800 pixels (1664 by 1200)—enough room for almost 2000 standard-size cells in Excel, for example. Granted, the text is quite small, but I personally prefer the ability to see as much as possible without having to pan around to get the big picture.

In addition to multiple resolutions, each monitor sports a host of nifty features. The L-View Multi-Mode has options for pop-up menus, enlarged menu-bar fonts and cursors, as well as simple screen-capture and screensaver utilities. The QuickView also offers enlarged menu-bar fonts and a screen saver, plus the ability to finetune the brightness and contrast controls through software.

Sigma Designs' L-View Multi-Mode (left) and E-Machines' QuickView 721

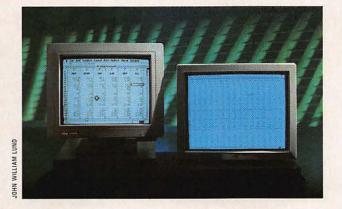


Image Clarity

Fancy features aside, the true test of a monitor is how well it displays images. To my eyes, the L-View Multi-Mode appears both sharper and brighter than the QuickView, although the E-Machines monitor is by no means excessively fuzzy or dim.

I was unable to detect flicker at any resolution on either monitor, although admittedly the perception of screen flicker is subjective. A vertical scan rate of 65Hz—the screen is redrawn 65 times each second—is considered sufficient to eliminate flicker. The L-View Multi-Mode boasts a 92Hz vertical refresh rate at 72 dpi, but only 60Hz at 120 dpi. The QuickView checks in at 69Hz or 76Hz, depending on screen resolution.

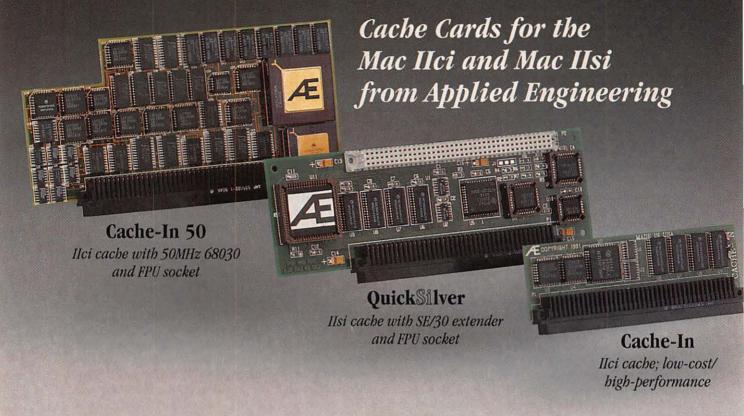
Although both manufacturers provide built-in tilt-and-swivel stands, ergonomically E-Machines loses out to Sigma Designs. The brightness and contrast knobs are inconveniently placed toward the rear of the Quick-View, the power switch is on the back, and there is no power indicator. On the L-View Multi-Mode, brightness and contrast knobs are up front but unobtrusive, the power switch is easily accessible on the right-hand side, and a power indicator is clearly visible on the front.

The L-View Multi-Mode meets European standards for very-low-frequency (VLF) electromagnetic emissions (see "The Magnetic-Field Menace," *Macworld*, July 1990) and battles glare with an optional OCLI screen. The QuickView, on the other hand, has a chemically etched screen with low curvature to reduce glare. While the screen does a good job at diffusing overhead glare, focus is a little softer as a result.

I found the Sigma Designs L-View Multi-Mode easier on the eyes and pocketbook. By tying resolution to pixel dimensions, its mode of operation is also conceptually easier to grasp, since you always have the entire desktop right in front of you. However, for certain niche applications, the virtual desktops of the E-Machines QuickView Z21 may be just what you need. It too is a fine, flexible monitor, although a bit pricey.

-Owen W. Linzmayer

Applied Acceleration



You need more speed. It's a basic fact of computing. Applied Engineering has the speed you need in our line of superior cache cards for the IIci and the IIsi.

Quick Nover™ spurs IIsi processing speed up to 40%. A speed increase you can appreciate every time you open a window, zoom, search, refresh or scroll. But Quick November is more than a cache card. Its SE/30 style connector allows you to plug in peripherals designed for the SE/30. Pop a 20MHz 68882 math chip into the on-board socket to instantly accelerate recalc and redraw speeds of spreadsheets and CAD programs. Quick November 18i both speed and expansion on one board.

Cache-In 50[™] rockets your IIci to speeds beyond the IIfx. The ultra-fast 50MHz 68030 CPU combined with an advanced 64K cache gives your IIci the power you've been longing for. Cache-In 50 uses CMOS components for minimum power consumption. Its meticulous design allows room for an internal 5.25" hard drive. Plug a 50MHz 68882 math coprocessor into the on-board socket for high-speed number crunching.

Cache-In™, our low-cost/high-performance cache, boosts IIci processing speed by up to 40%. Like the Cache-In 50, the compact Cache-In fits neatly into the IIci's cache socket and still leaves room for an internal 5.25" hard drive. Its 9 surfacemount components use very little power. Cache-In provides your IIci with a lot of performance for a little *cache*.

Applied Engineering's hardware know-how doesn't end with cache cards though. We also make a full line of internal and external data/fax modems — the DataLink family — designed specifically for the Macintosh. Applied's QuadraLink provides four extra serial ports for the

Mac II series. Our 1.44Mb 3.5" external floppy drive is fully SuperDrive compatible as well as affordable. We also make memory boards for the Portable, the Classic, and the II's.

Call Applied Engineering or your dealer to order or for more information about our enhancement products for the Macintosh.



The enhancement experts.
A Division of AE Research Corporation

(214) 241-6060 FAX: (214) 484-1365

P.O. Box 5100 Carrollton, TX 75011



© 1991. AE Research, Inc. All rights reserved. Brand and product names are registered trademarks of their respective holders.

Circle 124 on reader service card



Math Game for Children

NUMBERMAZE DECIMALS & FRACTIONS 1.01

Pros: Suits a wide age range; kids enjoy it; superb color graphics. Cons: Older kids might tire of the game before mastering the math. Company: Great Wave Software. Requires: Mac 512KE (400K disk version available).

List price: Black-and-white version \$49.95; color version \$69.95.

In my 1989 review of Great Wave's wonderful Number-Maze program (*Macworld*,

August 1989), I listed two cons: "No large-screen or color support; doesn't cover fractions or decimals." Somebody at Great Wave must have been listening. The company's program, NumberMaze Decimals & Fractions, teaches decimals and fractions using the NumberMaze game format—and it comes in a dazzling color version. (The color version works on black-and-white machines too.)

An Amazing Resemblance

Like its predecessor, NumberMaze Decimals & Fractions couches math drill and practice in a maze-game format. The student uses the mouse to move an object through a maze riddled with doors, gates, walls, and rivers. The object might be a buzzing bee lured by a honeycomb, or any other randomly selected creature.

When a playing piece hits a wall, the point of view on the screen changes from a relatively plain Pac-Man-style maze map to a meticulously illustrated head-on view of a gate. Different gates are based on different art styles; some are just beautiful. But to a kid, these gates are simply obstacles, and the only way to get past them is by solving the math problems that appear next to them.

Problems range from simple decimal place questions appropriate for young grade-schoolers ("Write as a decimal nine hundred and ninetynine") to complex fractional computation problems that will challenge teenagers, such as

 $14 \div 8^{5/18} =$

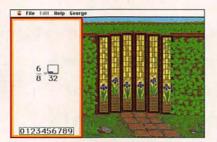
NumberMaze takes advantage of the sound capabilities built into System 6.0.7. A speech option in the File menu lets you choose whether the program recites the problems when they're displayed. Graphic obstacles respond to correct answers with animated sequences: doors open, curtains part, and boats cross rivers. There's lots of variety in these sequences, but not enough to prevent repetition, even in the same game.

Smart Mazes

NumberMaze Decimals & Fractions responds intelligently to incorrect answers. The first mistake is answered with a cursor under the first incorrect digit. Additional mistakes cause the Help menu to flash, reminding the student that hints are available. Eventually the program reveals the correct answer. If a student makes repeated mistakes, the program suggests that the student might want to work on an easier level.

NumberMaze Decimals & Fractions provides several variations on the basic plot. Some walls have no gates; the only way to get past the wall is by locating a ladder and moving it to the wall. Some mazes are littered with apple cores and pop cans that must be picked up before the maze can be completed. An occasional whirlwind might pick up a playing piece and deposit it in another part of the maze. Each time a player reaches the goal—a house in the corner of the maze—a new decoration is added to a room in the attic.

A third-grader can start with the easiest level of NumberMaze Decimals & Fractions and work his or her way up sequentially, skipping forward or backward on command. Each com-



Problem Gate Each colorful gate in NumberMaze Decimals & Fractions can be opened only with correct answers to math problems.

pleted level presents an opportunity to print a certificate of completion. An older child can work with problems more appropriate for his or her grade level. There are dozens of mazes for each grade from 3 to 8, plus options for adult learners. Each curriculum is modeled after leading textbooks.

This program is designed to be used in either the classroom or the home. Special lab packs and network versions are available for classroom use. The program can record the progress of students in password-protected student files.

The accompanying CustomMaze Decimals & Fractions program enables teachers or parents to display or print files for individual students or the entire class. A teacher can even request printed problem sets for students to use away from the computer. When used with System 6.0.7 and sound-input hardware, the program allows you to customize its speaking voice. And the excellent manual has thorough instructions for the teacher or parent who wants to adjust the curriculum for special situations.

Maze Praise

I asked my young software-testing team to compare this program with NumberMaze. They unanimously agreed that as much as they'd praised the original, Decimals & Fractions is even better. They especially liked the graphics and the added plot twists.

But they also tired of it more quickly than they did the original. After a few sessions they complained about the repetitious scenes and the tedious math problems. This isn't surprising, given all the time they spent playing the original Number-Maze—there's not a great deal of novelty here for a Number-Maze veteran. The older kids were the most vocal when boredom set in; cute mazes and buzzing bees just can't keep a teenager happy forever.

Nonetheless, this program is an important addition to the growing family of educational software for the Macintosh. It's an educationally sound, entertaining, and thorough approach to a neglected part of the math curriculum.—George Beekman and the Shoohedoohop Software Testing Team

JUST RIGHT

16-INCH E-MACHINES DISPLAY



16-INCH COLOR PRICED JUST RIGHT FOR THE ENTIRE OFFICE

Introducing ColorPage™ E16, now 16-inch color priced just right for the entire office.

For big, bright, beautiful color plug the ColorPage E16 into your

Macintosh LC, Ilsi or Ilci built-in video; no additional hardware necessary. Need room for working with large spreadsheets, desktop publishing layouts or multimedia applications?

Add an E-Machines accelerated 8 or 24-bit color interface card and turn your ColorPage E16 into a high performance screamin' fast display. Go ahead, experience what high performance color is really like, and how affordable 16-inch displays have become.



E-MACHINES

E-Magination at work™

For your nearest dealer, call or write. 9305 SW Gemini Drive, Beaverton, OR 97005 Fax: 503-641-0946

1-800-344-7274

Circle 303 on reader service card



Instrument-Control Software

LABVIEW 2

Pros: Complete, efficient, highly evolved; easy to use; includes "virtual instruments" for all common applications. Cons: Large, complex package for professionals only. Company: National Instruments. Requires: Mac Plus; 4MB of RAM; hard drive. List price: \$1995.



Macintosh users in science, engineering, and manufacturing control instruments

ranging from digital thermometers to laser beam profilers to factory-size machining stations. Only a handful of companies serve this market, perhaps because National Instruments (NI) took a big early lead in both data acquisition and interface programming and has energetically maintained that position over the years. NI's LabView 2 is formidable. It is the easiest icon-based programming system available, its interface-building facilities are relentlessly complete, and nearly every interface you can imagine has been packaged in one of LabView's libraries anyway.

I/O, I/O, It's Off to Work We Go

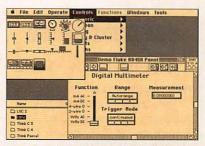
To make the Mac useful as a lab instrument, you must contrive to get data into the computer (with an analog-to-digital conversion board), represent the data in a convenient form for processing and graphic display, and also get control signals back from the Mac (digital-to-analog conversion) to control experiments or real-world machine functions. All the input/output functions and swapping data back and forth from registers on the Mac to buffers on the data-acquisition boards can, of course, be done in C, Pascal, or assembly language, but this is error-prone and uncongenial work. The software solution to this difficulty, substantially pioneered by NI, is the virtual instrument, or VI, a screen programmed to show the set of buttons, knobs, indicators, and connectors you would find on a real instrument. You can use one of the preprogrammed VIs in the package (there are more than 100 from NI, and

still others from third parties) or construct one by connecting control-element icons from an assortment of palettes. The VI consists of the front panel that simulates an instrument, and a block diagram of control elements that constitutes the program defining the instrument. VIs and block diagrams can be simply modified and combined-you can hook up an NI I/O board, display your acquired data on a virtual Hewlett-Packard oscilloscope, and (particularly if your equipment uses the general-purpose interface bus, or GPIB, interface) program Mac-directed experiments.

New for 2

This scheme is wildly superior in time savings and bug avoidance to textbased data-acquisition programming. Other vendors offer some similar programs—Analog Connection Workbench from Strawberry Tree, for example—but no one offers anything this size. LabView 2 includes more than 600 support files, for a full 20MB of software support. The program incorporates speed and convenience improvements. The main speed improvement is the inclusion of a compiler: the block diagrams are automatically compiled upon execution (for \$495 you can buy a run-time module and use it to distribute compiled VIs or other applications) and run about as fast as an MPW Pascal program. Since LabView 2 includes an impressive digital-signal processing (DSP) function library and routines for array/matrix processing, having a compiler means that you can do intensive number-crunching in LabView itself, rather than sending the data out to other programs. This is a serious numeric programming environment worth a few thousand dollars in its own right, with Hilbert transforms, every type of digital filter, statistical analysis, diagonalization of complex matrices, and a hundred or so other built-in capabilities.

Convenience has been enhanced principally by meeting Macintosh users' expectations better: Connections between elements now automatically stretch when you move them in block diagrams, cut-and-paste now applies to clusters of VI elements, scroll bars now let you move around in charts



Not Just a Fluke This Fluke Digital Multimeter is one of the virtual instruments in the LabView 2 package. The front panel is assembled from icons such as those in the Numerics palette, and functionality is programmed with a block diagram that's an outstanding example of object-oriented iconbased programming.

and graphs, and the set of control icons has been expanded to cover nearly every common type. For the cases, which should be rare at this point, in which you absolutely need to call C or Pascal routines, LabView now offers code interface nodes as a way to link the routines to your block diagrams. And now you can produce more-realistic front panels.

The View for You

You don't need a Mac IIfx to write letters to Grandma, and you don't need LabView if you're just monitoring the temperature in your wine cellar once a day. Here's a quick decision algorithm: if you didn't know what GPIB was when you woke up this morning, it's quite possible that Lab-View 2 is overkill for your needs. For simple data-acquisition tasks, products (both hardware and software) from IDAC, Biopac, IOtech, World Precision Instruments, or GW Instruments will be cheaper and faster to set up at first. But there are good reasons why LabView is the standard at serious research organizations and instrument companies. It can handle any data I/O or processing task easily, it makes quick work of complicated interface or numerical-analysis problems, and offers, besides a brilliantly executed programming scheme, access to a vast array of canned solutions from NI and dozens of third parties. And if you have the kind of professional instrumentation and control needs LabView was designed to address, at \$1995 it's a remarkable bargain as well.—Charles Seiter



Educational Simulation Games

THE OREGON TRAIL

Pros: Thoughtful educational simulation; entertaining arcade sequences; outstanding color graphics. Cons: Some events are repetitive; students can choose to avoid educational aspects of the game; copy-protected.

Company: MECC. Requires: Mac Plus:

Company: MECC. Requires: Mac Plus; System 6.0.2. List price: \$49.95.

WAGON TRAIN 1848

Pros: Same quality simulation as
The Oregon Trail; innovative groupware
aspect facilitates cooperative
learning. Cons: Intermittent networking
bug. Company: MECC. Requires: Two
networked Mac Pluses; System
6.0.2. List price: \$379; additional fivestation packs \$99.



If there are classic educational software packages, MECC's The Oregon Trail is surely one. Nearly all the middle-school kids I know have played the simulation

game on Apple II computers at school (admittedly, I live in Oregon). What's more, they love it.

MECC's new version of The Oregon Trail includes several new features that take advantage of the Macintosh's additional capabilities; Wagon Train 1848 is a first-time-ever network version of the game.

Setting Out on the Trail

Both games are a detailed simulation of the hazardous journey pioneers took from Independence, Missouri, west to Oregon's Willamette Valley. They're designed for kids age 10 and up. As in other MECC games, a password-controlled Management menu lets teachers and students access customizing options.

After entering a name and choosing an occupation, a player acquires clothes, food, wagon parts, oxen, and miscellaneous supplies for the trip. The amount of money he or she begins with depends on the chosen occupation; as in the real world, bankers, for example, have fatter wallets than do teachers. But players who fin-

ish the trip can earn higher point totals despite choosing less financially rewarding occupations.

Once outfitted with a wagon and supplies, it's time to begin the journey. Three window panes monitor the wagon's progress. The top one shows an animation of the trip; the middle one traces the route on a map; and the bottom one provides a play-byplay in a scrolling trail log (see "Wagons Ho!"). Some events are out of the players' control, but these games are not for passive potatoes. Players must continually take stock of conditions and make critical decisions. Stopped at the Kansas River crossing, they must decide whether to ford the river, caulk and float the wagon, or spend \$5 for a ferry ticket.

Interactive buttons labeled Pace, Rations, Buy, Trade, Guide, and Rest give players control over many of the excursion's parameters. My young caravan especially liked Talk, which brings up images of people along the trail who have words of wisdom to share; and Hunt, which temporarily turns the simulation into an arcadestyle shooting game. Occasional hunting is necessary to keep food on the table, but many kids choose it even when their wagons are stuffed with rations. Players who survive the hazards of the Great Plains and the Rockies are rewarded with another arcade-style treat: a shortcut raft trip down the Columbia River.

All is not fun and games. A player who makes foolish decisions (and sometimes even wise ones) can lose supplies, food, traveling companions, even his or her life—an element of realism that brings history to life as few textbooks can.

My testers unanimously praised the Mac version of The Oregon Trail, agreeing that its vivid graphics and added features make it far superior to the Apple II version. Asked if they learned from it, they responded less uniformly. Some said they just played it for the "fun stuff" like hunting and rafting; others said it helped them understand what it was like to be a pioneer in 1848.

Circle the Wagons!

The two simulations are identical except for one critical detail: Wagon Train 1848 allows several students to join in the same simulation from networked computers; it may be the first groupware for kids. No file server is necessary; the lab pack comes with enough disks for five computers, with an option of buying additional five-station packs.

Each computer represents one covered wagon in a wagon train. As students travel together, they can trade supplies, food, and the like with each other, send messages to each other, hold on-screen conferences, and monitor the status of all other wagons in the train. Decisions can be made either democratically or autocratically, depending on the chosen form of government. Either way, the group interaction—problem solving, negotiations, communication-tends to become the major focus of the game, overshadowing the hunting, rafting, and other favorites of the single-player game. Wagon Train 1848 brings cooperative learning to the small screen.

My testers played Wagon Train 1848 for hours. In the process, they *(continues)*



Wagons Ho!
Wagon Train 1848
and The Oregon
Trail have identical
screens, but the
groupware aspect of
Wagon Train 1848
makes it a completely
different experience.

Call Our Number.

CompuServe, the world's largest and most comprehensive network of people with answers to your hardware and software questions, is waiting to hear from you.

For more information about CompuServe and our product support services, just mail this card or call 800 848-8199.

Name	
Address	
City, State, Zip	
Telephone ()	CompuServe



MacWorld/Oct

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 407

COLUMBUS, OHIO

POSTAGE WILL BE PAID BY ADDRESSEE

CompuServe®

ADVERTISING DEPARTMENT PO BOX 20212 COLUMBUS OH 43220-9988

Idealadhaahdadhlaaddaaladadadadadada

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES





Product support for your Mac.

CompuServe, the world's largest network of people with personal computers, is also the world's largest network of people with answers to your hardware and software questions.

Brains abound on CompuServe. You'll find quick solutions and information from our thousands of forum members, some of whom have

too, discussing the next generation of products, and giving CompuServe members software updates before they hit the market.

Got a question? Got a problem? from the many minds of CompuServe.

To order direct, or for more information, call us today.

CompuServe® 800 848-8199

Circle 319 on reader service card

Imagine getting twice the Bernoulli for two-thirds the price.

The new Bernoulli 90MB.



Welcome to the next generation of removable storage, the new Bernoulli[®] 90 from the

leader in removable storage—Iomega®

At 90 megabytes per removable disk, we've more than doubled our capacity. Yet the new Bernoulli 90 is actually less expensive than our own Bernoulli 44, as well as other removable-disk drives. A lot less. And with a new, 19-msec effective access time, a lot faster, too.

But the best part is, it's all Bernoulli. Rugged, reliable, endless storage. The most

comprehensive removable-disk drive ever. The new Bernoulli 90 is exactly what storage-intensive Macintosh users demand.

More value.

The new Bernoulli 90 is now considerably less expensive than other removable drives of similar capacity. Granted, competitive pricing alone doesn't necessarily mean value—so consider what else you don't get with other removable-storage drives.

ted Bernoulli Technology® which frees you from head crashes. You don't get removable disks that can withstand 1,000Gs of shock. You don't get the ability to compress 180MB onto a

You don't get paten-



90MB disk. You don't get a 5-year limited disk warranty. You don't get Central Point's Mac Tools Deluxe or Dantz's Retrospect software. And you don't get a 19-msec effective access time.

In short, you don't get a Bernoulli.

Bernoulli at a Glance.

Drive Specs.

Effective access time: 19 msec Transfer rate: Up to 20Mbits/sec MTBF: 60,000 hours

Disk Specs.

Capacity: 90MB formatted Warranty: 5 years Shock tolerance: 1,000Gs Drop height: 8 feet

Units Sold.

Drives: 700,000 Disks: 4,000,000

More ways to get attached.

The new Bernoulli 90 is welcome relief from pigeonholing technologies. Bernoulli is compatible with every major operating system, as well as workstations. With Bernoulli, no Mac is an island.

More recognition.

Important publications have given Bernoulli welcome recognition, but our biggest supporters are Bernoulli users. In fact, we have a 98 percent satisfaction rate. Perhaps it's due to



our worldwide support network, and our 24-hour* drive replacement service.

And as if 98 percent wasn't enough, we've designed the 90 to read 44MB disks, and we're instituting an attractive Bernoulli upgrade program to help get every current Bernoulli user into the 90s. And protect your investment.

Call 1-800-777-4197.

Questions? We don't blame you. There's a lot more you should know about—like our free 90MB disk offer, drive configurations, Bernoulli

Technology, and specific pricing. So we've prepared a free brochure that you can have by placing a simple phone call. Find out today what a welcome change Bernoulli can be. Before the 90s leave you behind.



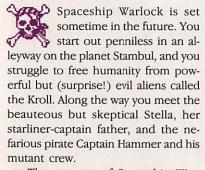
Circle 260 on reader service card

uncovered a bug that can spoil the experience. Sometimes network messages come across garbled, occasionally freezing a computer and locking it out of the game. (When this happens, the other players can continue the journey without the "missing" wagon.) MECC promises to fix the bug in a maintenance upgrade this fall. Let's hope so. Wagon Train 1848 pioneers an entirely new genre of educational software; it deserves to finish the journey.—George Beekman and the Shoohedoohop Software Testing Team See Where To Buy for contact information.

Interactive Movie on CD ROM

SPACESHIP WARLOCK

Pros: Ground-breaking color graphics and 3-D animations. Cons: Often slow. Requires: Mac II; 4MB of RAM; CD ROM drive; 13-inch or larger color monitor; System 6.0.2. MultiFinder not recommended. Company: Reactor. List price: \$95.



The creators of Spaceship Warlock, Reactor's Mike Saenz and Joe Sparks, rightly do not label it a game, instead calling it an "interactive movie" because the plot pretty much proceeds from A to Z with few diversions. However, it does have lots of standard adventure-game elements: problems to solve, mazes to navigate, and several places where you just have to blast those hulking-yet-so-unlovable aliens.

What sets Spaceship Warlock apart from other personal-computer adventure games is not its classic story line but its amazing high-resolution color graphics and three-dimentional animations. In one remarkable sequence, 3-D asteroids tumble past the windows of the spaceship. The boulders look

so much like asteroids that I found myself wondering if the crew could pilot the ship past all the hurtling rocks. An added attraction is the totally unexpected and hilarious Robin Leach send-up near the beginning, and there are other humorous touches later in the game.

Not all adventure-game fans will find Spaceship Warlock completely absorbing: the interactive-movie format offers little room for different successful approaches to the same problem and affords only a few ways to make serious mistakes (mostly by getting killed in battle). That's not necessarily bad: if you've ever made a mistake in the adventure game Zork Zero, say, and had to start over several thousand moves later . . . well, need I say more. But if you demand a new challenge at every turn, if you have to find a puzzle or a clue in every new frame, you probably won't find Spaceship Warlock challenging as a game, though you may find it entertaining. Personally, I found its game aspect acceptable.

The main problems with Spaceship Warlock are its repetitiveness and slow speed. Too many times you are sent back to your quarters, only to be recalled soon after you get there. You can get around that by going to the nearest view screen and clicking on it; usually the captain then summons you right away. I must say, even as I was slogging along with my slowerthan-spec CD ROM drive (Reactor recommends using drives with a 380 milliseconds or faster access time), I was eager for the next alien encounter or the next asteroid belt. If the slowness really bothers you and you have a high-capacity hard drive, you can copy the 128MB of programs and data from the CD ROM onto your hard drive. The game then plays blazingly fast.

The best news for adventure-game fans is that Spaceship Warlock is light-years ahead of Reactor's earlier effort on CD ROM, the erotic Virtual Valerie. If Reactor's next effort is even one-tenth as much improved in its story line and robustness it will be fabulous. I recommend that Reactor offer a choice of male and female points of view in its next opus, since Spaceship Warlock fits a little too snugly in the category of "toys for boys."

A Great Excuse to Buy a CD ROM Drive

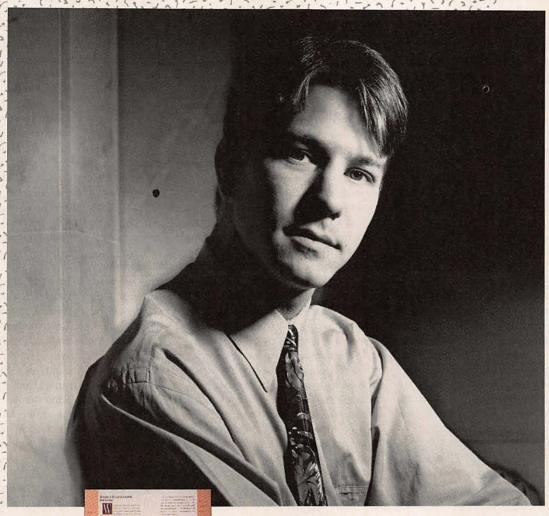
At its list price of \$95, Spaceship Warlock is costlier than most games. Since it takes only about 8 to 10 hours of playing time to get through (depending in part on the speed of the CD ROM drive), some might not consider it a good value. But given the tremendous amount of work that went into creating the 128MB of programming, music, sound effects, graphics, and so on, it's hard to see how Reactor could charge any less. After all, Spaceship Warlock is coffee-table software.

If you already have a CD ROM drive and you appreciate terrific graphics, Spaceship Warlock is a great candidate for your CD ROM library. If you don't yet have one, Spaceship Warlock is an excellent excuse for buying a CD ROM drive. For better or for worse, I found the thumping theme song going through my head in the shower. OH, ob-ob-OH, SPACE-ship WAR-LOCK.—Tom Moran



Your Best Friends in the Universe Captain Hammer of the Spaceship Warlock orders you to lead a boarding party of mutant space pirates onto an enemy battle cruiser.

"QuarkXPress is a program designed from an artist's point of view."









Mike Astrachan, Computer Graphics Specialist, Kuhn & Wittenborn Advertising

"Artists can't afford to be stifled by shortcomings in software. QuarkXPress provides the control and flexibility we need to complete our clients' projects in less time and for less money, while maintaining the same high quality you get with conventional methods. The program's measurement tools take the guesswork out of item placement. With features like the ability to rotate text and pictures precisely, the program lets our designers try several different approaches before settling on the best one. QuarkXPress is simply the most sophisticated page layout program around."

Kuhn & Wittenborn Advertising was established in 1978 by Whitey Kuhn and Dale Wittenborn, former design managers at Hallmark Cards. Today their company is one of the foremost computerized advertising agencies in the Midwest.

If you need a page layout program designed with artists in mind, visit your local dealer for more information.

Quark**XPress**。

The Choice for Publishing Software Worldwide



Spreadsheet Compiler

MASQUERADE 1.1

Pros: Easy way to construct financial applications; simpler than using "real" programming language; macros and charts on worksheet. Cons: Less than full Excel functionality. Company: Night Diamonds Software. Requires: Mac Plus; System 6.0. Recommended: Hard drive. List price: Version 1.13 \$695.

A spreadsheet compiler is a program that turns a spreadsheet-including formulas, macros, and charts-into a stand-alone application. On the PC side of the fence, several compilers appeared four years ago for the ubiquitous Lotus 1-2-3 worksheets; Masquerade now offers developers a way to include much of the scope and flexibility of Excel in compiled worksheet-based applications. Although it can also compile worksheets saved as SYLK files from Full Impact and Wingz, it's really designed as a way for Excel users to convert templates or "applications" in Excel into real double-clickable programs with their own icons.

The key points about these applications is that, unlike worksheet templates still coded in Excel, they do not require Excel itself to run, they are compact, and they cannot be changed by the end user. In Masquerade, the security aspect of compilation is further enhanced by password-based encryption, so curious users can't even inspect the application's resources with ResEdit.

Application\$

This development environment, while encouraging, does not have the flexibility of generic applications such as MacApp, much less the power of a standard programming language. Although they can be used to solve eigenvalue problems in quantum physics, spreadsheets are really about money, and Masquerade applications will mostly be concerned with sales, income, expenditures, and financial controls. Since most third-party developers working with databases or spreadsheets ultimately focus on applications in these areas, Masquerade's

limitations shouldn't be a problem.

Here's the process. You start with a new worksheet or import one in SYLK format and develop the worksheet-or worksheets (Masquerade can handle linked sheets)-until it follows your design. In developing a worksheet that corresponds to an original Excel design, you must note four important differences: some Excel functions and macro commands aren't available, database functions aren't present, the worksheet itself can include charts (a big plus), and macros can be included or stored on a separate sheet (you store them on separate sheets if you need backward compatibility with Excel). Another interface difference, one that lets you create an "independent application" flavor, is Masquerade's menu-bar customization, a dialog box macro function, and the use of on-sheet buttons (push buttons for macro activation, radio buttons and check boxes for choice selection). It's also possible to add a help annotation for any worksheet cell.

The principal difference between Masquerade and a standard spreadsheet program is in the Compile menu, which offers Create Application as an option. In practice the compilation process is quite forgiving, compiling formulas in which you have made errors. The process can take less than a minute for a small worksheet (10 by 20 cells) consisting mostly of formulas and text, and ten minutes or more for complex linked sheets. I used a variety of samples from the Heizer Software collection of Excel templates ranging in size from 360K to 585K. The use of compilation, although nearly automated, requires

Folding Up the Sheets Under the Compile menu, Create Application calls up a dialog box full of compiler options. The compiler turns your worksheet (or linked sheets) into a stand-alone application with a generic application icon.

that you know a bit about Mac program organization, or at least have an understanding of what a resource is and why and when you need ResEdit. As a rule, all but the simplest worksheets require some modification to ensure that Masquerade can recognize all the functions and macros used in the Excel examples. If you are developing applications for use with Masquerade, you can usually avoid conflicts in the first place and make extensive use of buttons and custom menus to design more attractive applications. After compilation, you will want to test your application extensively to catch errors the compiler ignored, perhaps using the simulation mode to step through your work.

Entomology

This is a new program, it's ambitious, and it understandably has some bugs. Window handling can be mysterious, charts sometimes fail to appear as expected, grid lines and frames get fragmented, and crashes seem to occur once an hour in steady use. But version 1.1 is a great improvement over 1.01, and Night Diamonds is conscientiously whittling down the bug list—there's close interaction between the customers and tech support.

=SUM

If you have recorded a few macros, you can produce compiled versions of your favorite templates. If you want, for example, to design a multiperson expense account form for use on a network—say you want your sales staff to enter their expenses and have the program calculate reimbursements and print a report-the Masquerade approach is simpler database programming than 4th Dimension's, and much easier than starting from scratch in Pascal. Furthermore, your staff will only be able to enter data, with no possibility of tampering. If you want to design a basic dental-office accounting system for sale to small offices, you can get the job done faster in Masquerade than in alternative approaches. If you can live with some flaws while Night Diamonds works on polishing the program, you will find Masquerade a valuable programming investment.—Charles Seiter

MANAGE the unmanageable

Ray Peddin hadn't felt so much in the hot seat since he completed his Air Force tour of duty in Vietnam.



As Director of Management Information Systems for Stanford University Clinic, he was responsible for replacing their existing computerized systems with more sophisticated technology.

The project was both complex and risky. The accounts receivable contained \$38 million, a perishable asset for which significant losses could be incurred if the conversion were not 100% effective. The last time the system was updated, millions of dollars had been lost, as well as the jobs of those responsible. Understandably Ray was nervous.

He turned to the professionals at Micro Planning International for assistance. An MPI consultant worked with Ray's team, the new system vendor, and an independent health care consultant, to coalesce their views of the project into one workable plan acceptable to all involved. He trained team members in the principles of project management, as well as how to use MPI's state-of-the-art software to control the project. The plan was revised to resolve resource conflicts and a suite of custom reports for monitoring the project was developed.

Stanford Clinic's new Management Information System was up and running December 13, on target.

In Ray's own words, "I couldn't have done it without MPI. The consultant was an experienced professional and the software unparalleled in ease of use and sophistication."

Full Service Project Management from



Micro Planning International 655 Redwood Highway, Suite 311 Mill Valley, CA 94941 (415) 389 • 1414

Boston • Bristol • Los Angeles • Manchester
Melbourne • San Francisco • Sydney • Washington D.C.

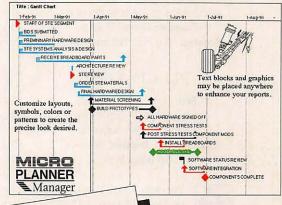
Circle 217 on reader service card

Why 4 out of 5 MacProject II users prefer new MICRO PLANNER Manager

New MICRO PLANNER Manager provides you with the versatility and power to manage the way you manage best. Your way.

Apparently, MacProject II users appreciate the freedom to build projects from PERT, Gantt, Outline or Table formats and to customize reports to meet their specific needs.

In a recent survey, experienced MacProject II users rated Manager superior in Ease of Use, Reporting capabilities, Performance, and Overall Value.



	Manager MacF	Project II
Today: 10-Jun-91 Project: Manuert vs MacPenisct IL Survey. Output: 1 Designed This Report Myself Exac of Use Inter Desktop for Organizing Projects Input Perability via choice of PERT, Canta, Cautine, or Table formats Input Perability via choice of PERT, Canta, Cautine, or Table formats		Designing reports is so easy that we made this one
Reporting Design new reports of rest specific requirements. Design new reports with cast or graphics Annotate reports with cast or graphics. Create Ganti symbols. WISS Tree for information roll upi Saved reports audomatically refreshed when analysis changes made Linked Gant Charts Performance Task splining Resource Optimization Group Resource Optimization Multi public Resource Optimization Multi public Resource Optimization Earned Value Con Analysis Compatibility with high end software for multi-project consultdated Compatibility with high end software for multi-project consultdated		to show you why MacProject II users prefer Manager.
System 7 Compatible Overall Rating Value for money		111-200

For a limited time, you can upgrade from MacProject II, FastTrack or MacSchedule for *only* \$99 and since Manager reads MacProject II files, you'll be up and running in minutes.

For making presentations and proposals or managing and controlling just about any project, *new* MICRO PLANNER Manager is the informed choice.

MacProject II is a registered trademark of Claris Corporation. MICRO PLANNER is a trademark of Micro Management Inc. InstaPlan is a registered trademark of Micro Management Inc.

MICRO PLANNER	Call 1-800-852-7526 VISA/MC/AMEX/Checks: Add \$10 S & H: \$10 Canada \$60 International: CA/FL residents add 6% Sales Tax					
Manager						
□ Send Manager \$595	Card#	CAMP ST	Expires:			
☐ Upgrade me from MacProject II, FastTrack or MacSchedule for \$99	Signature:					
(Include Program Disk & Manual Cover).	Name:					
Send info on: MICRO PLANNER Manager	Company:					
☐ MICRO PLANNER X-Pert	Address:					
☐ MICRO PLANNER for Windows			Phone:			
☐ InstaPlan for MS-DOS ☐ Consulting/Training	City:	State:	Zip:			

*

CD ROM Drives

CDA-431

Pros: Good audio facilities: compact design; switchable SCSI termination. Cons: Driver software doesn't notice some disc ejections: documentation needs improvement. Company: Chinon America. Requires: Mac Plus. List price: \$795.

PLI CD-ROM

Pros: Good audio facilities; switchable SCSI termination. Cons: No power indicator. Company: PLI. Requires: Mac Plus. List price: \$999.



Two new CD ROM players one from Chinon, a relatively new player in the Mac mar-

ket, and one from PLI, one of the oldest suppliers of Macintosh hard drives-are the latest of a growing group of third-party CD ROM players available for the Mac (for a review of drives from NEC, Toshiba, and CD Technology, see Macworld, September 1990). I found that both these drives performed well, and although the Chinon unit is the lowest priced CD ROM drive Macworld has reviewed to date, it doesn't skimp on any essential features.

CDA-431

The CDA-431 drive doesn't take up much room on the desktop because the external power supply sits on the floor. The drive's front panel has both power-on and drive-activity lights, as well as an eject button. The drive has excellent audio facilities, with a frontpanel headphone jack and rotary volume knob, and stereo line-level RCA-jack outputs on the rear panel. The drive mechanism is made by Chinon. The SCSI address is set with DIP switches.

The software that comes with the unit includes two drivers, one for the Macintosh Plus and SE, and one for the SE/30 and the Macintosh II family, along with files that allow recognition of CD ROMs in the High Sierra, audio, and ISO 9660 formats. You control the audio features of the drive with a desk accessory called CD Control, which resembles an audio CD player's remote control.

One bug I found with the driver software: if you use the eject button on the CDA-431's front panel, the driver software doesn't notice that the disc has been ejected, and it doesn't dim the icon of the CD ROM on the desktop. If you then attempt to double-click on the icon, you receive an error message.

With the CDA-431, Chinon includes a CD ROM disc from Educorp (version 2.0) that contains more than 500 megabytes of public domain and shareware software. I found this CD ROM to be a very mixed bag; although there are many useful programs and files on the disc, a lot of the files included, especially the clip art, are mediocre. There are also many duplications; Educorp could have used a bit more care in putting this collection together.

The user manual is generally complete, but lacks Chinon's address and phone number for technical support. A diagram of the rear panel also incorrectly identifies the two audio output jacks as "Power Jacks."

The CDA-431 is priced below the top-rated drive we reviewed in September 1990, the CD Technology Porta Drive, and has better audio facilities as well. However, the Chinon unit cannot match the speed of CD Technology's Toshiba mechanism, which is still the fastest drive Macworld has tested.

PLI CD-ROM

The PLI CD-ROM is a zero-footprint unit, sized to fit under a Mac SE or Classic. Based on a Sony mechanism, the PLI drive has very good audio facilities. The front-panel headphone jack has a rotary volume control, and there are stereo line-level RCA-jack outputs on the rear of the unit. The PLI CD-ROM drive has a rotary SCSI-ID selection switch. The front panel lacks a power-on indicator, but has a light to show drive activity. Like the Chinon unit, the software includes an INIT for mounting CD ROMs, and a DA for controlling the drive's audio functions.

The PLI CD-ROM was faster in my speed tests than the Chinon drive, and



The CDA-431 from Chinon America and the PLI CD-ROM from PU

the difference is readily apparent when you use it. The general response of the PLI CD-ROM-in particular when launching files-feels quicker than that of the CDA-431, although the PLI CD-ROM, like all CD ROM players, is much slower than a magnetic hard drive. I did find, though, that setting the RAM cache to at least 64K in the Macintosh's Control Panel greatly speeds opening multiple files in succession, because the Macintosh does not have to reread the directory on the CD ROM each time I give it the Open command.

Both drives incorporate a welcome addition to external SCSI devices, namely, switchable SCSI termination. Using switches on the units, you can configure the drives as internally or externally terminated. I would like to see more drives using external termination.

Best for the Bucks

Either choice is a good value in today's market. Chinon's CDA-431 unit wins points for taking up less desktop real estate, for the included software CD ROM, and for being the low-price leader among the drives Macworld has reviewed.

The PLI CD-ROM is a solid unit that was faster in our speed tests, but its suggested retail price is more than that of the CDA-431. If performance is the most important factor for you, then the PLI CD-ROM is the better choice between these two units (but test out a Toshiba-based player before

buying a drive).—Tom Negrino

EXPLORER



Exceptional offer: \$8,800

Intelligent Resources[™] is proud to introduce the **Video Explorer**[™], a real-time digital video processing card for the Macintosh[®].

The **Video Explorer** integrates personal computer and video technologies by bringing the sophisticated graphic capabilities of the Macintosh to the video environment. The **Video Explorer** represents a new frontier in media integration, providing exceptional creative potential for developers and end-users.

To celebrate the release of the **Video Explorer**, we've assembled a bundle of five complementary software applications to make your interactive media exploration more exciting.

Purchase Video Explorer by October 31, 1991,

and as part of our introductory offer, you'll also receive the ElectricImage™ Animation System for rendering and animation, Time Arts'® Oasis™ for videographics / image creation, MacroMind's® MediaMaker™, for desktop video publishing, Letraset's® LetraStudio® for text and graphic manipulation, and Letraset's® ColorStudio® for color image retouching.

Imagine, for only \$8,800* you get these five software applications and the **Video Explorer** complete with RGB input and output modules, utilities software, and cabling.

Software developers, systems integrators, and users ...join us as the serious fun begins!

Call 1-800-882-8388 for more information.

INTELLIGENT RESOURCES

I N T E G R A T E D S Y S T E M S 1626 Colonial Parkway, Inverness, IL 60067-4732 Phone: (708) 705-9388, Fax: (708) 705-9410, AppleLink: IR. MKTG

* U.S. Only. International bundle version, (excluding Electric Image Animation System): \$8,000.00, ElectricImage Animation System \$7,500.00, LetraSet's ColorStudio \$995.00 and LetraStudio \$495.00, Time Arts' Oasis \$795.00, and MacroMind's MediaMaker \$695.00. Intelligent Resources and Video Explorer are trademarks of Intelligent Resources Integrated Systems, Inc.; Macintosh is a registered trademark of Apple Computer, Inc.; ElectricImage is a trademark of ElectricImage, Inc.; LetraStudio and ColorStudio are registered trademarks of Esselte Pendaflex Corporation in the United States, of Letraset Canada Limited in Canada, and of Esselte Letraset Limited elsewhere.; MacroMind is a registered trademark of MacroMind, Inc. MacroMind Media-Maker is a trademark of MacroMind, Inc. Time Arts is a registered trademark of Time Arts, Inc. Oasis is a trademark of Time Arts, Inc. Copyright© 1991 Intelligent Resources Integrated Systems, Inc.



Chart and Diagram Creation Software

TOPDOWN 3.0

Pros: Supports multistyle, multicolor text and text import; has new line paths; easier to use. Cons: Needs more complete tutorial; not fully System 7—compatible. Company: Kaetron Software Corporation. Requires: Mac Plus; System 6.0.2. Recommended: Hard drive. List price: \$345.

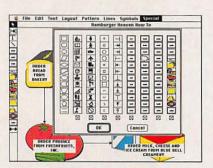


Just about any graphics package on the market can create charts and diagrams,

but none does it better or more easily than Kaetron Software Corporation's TopDown.

A TopDown document is essentially a graphic description of how to get from point A to point Z. TopDown can be used to describe a business plan or to show how an accounting department works, how to defuse a bomb, or how to make a hamburger. Each step is represented by a predefined or custom graphic image, accompanied by text. You join symbols together, either manually or automatically, by using lines with arrowheads. To read the chart, the viewer finds the beginning and follows the arrowheads (images and symbols can also be numbered).

Often a step in a procedure requires further explanation. TopDown



Plentiful Palettes You can select which of the nine palettes will be displayed in the revolving palette at the far left of the screen (you move through the palettes by clicking on the arrows at the bottom). The nine palettes are, from the left: ANSI (American National Standards Institute) flowchart symbols, two palettes of icon symbols, two palettes of node connectors, and four custom-symbol palettes. The custom symbols are being used in the chart.

allows you to create a related step, or subset, as a separate drawing through its Create Next Level option. Any symbol can have a lower level, and those symbols that do sport a drop shadow for easy identification.

New Features

The most obvious improvements to TopDown are in the new version's handling of text. Version 2.0 treated a text block as just that—a block: it was all one style and all one color (black). Version 3.0 allows any character in any text block to be any of eight styles and any one of eight colors. Providing you don't go overboard using them, these elements should help direct the reader's attention along the desired paths.

Another improvement is the addition of the text-import capability. You can now type a script in a word processor and have TopDown import the script and place the text inside a string of connected symbols.

TopDown has six new predefined line paths, for a total of nine (line paths provide options for routing lines among symbols). Each of the nine predefined paths is accessed by pressing the # key and a numeral key from 1 to 9, so it is now easy to experiment until you find the most logical and least congested route. Line paths can also be set manually.

Easier and Better

You select symbols and other drawing elements from palettes. Two new palettes contain 24 node connectors, which are used to show how lines cross and connect to other lines. The new Select Palettes option lets you choose which of nine palettes are to be displayed (see "Plentiful Palettes").

TopDown enables you to attach Notecards, or comments, to each symbol in a drawing. You can choose a new option to make all symbols with attached Notecards outlined in gray.

Some of TopDown's new features also make the program easier to use. You can resize a symbol to accommodate text that exceeds the size of the symbol, and you can move symbols in small increments by using the arrow keys. The Undo command is now fully functional. In previous versions it didn't work in all circumstances, such

as when you wanted to restore deleted text. Now it does.

The program is compatible with System 7, though it doesn't take advantage of Publish and Subscribe, and supports Apple's TrueType font technology. According to the company, the next version, due out in the first quarter of 1992, will support more System 7 features.

TopDown keeps getting better. Version 3.0 has reached a new level of sophistication and ease of use—a remarkable feat considering its price hasn't increased.—Philip Bishop

See Where to Buy for contact information.



Baseball Game

EARL WEAVER BASEBALL 1.5

Pros: Excellent simulation; can control pitcher and batter; provides a variety of ballparks; addictive.

Cons: Missing many attractive features of MS-DOS version; copy-protection scheme; disappointing digitized sounds.

Company: Electronic Arts.

Requires: Mac Plus; System 6.0.4.
List price: \$49.95.

In the MS-DOS league, Earl Weaver Baseball garnered rave reviews, but when it was

transferred to the Macintosh league, the simulated baseball game lost something on its fastball. The first clue is the documentation: a 66-page MS-DOS manual and a 12-page Mac supplement. Things get worse. The first item in the Mac document is headlined "Rained Out." It details all the MS-DOS features Electronic Arts left out of the Mac version, including pitching practice; park editing; frameby-frame slow motion; team and league editing and creating; printing; and features for creating, drafting, and trading players. The player and team statistics are also limited, and there is no support for color. I wish they hadn't told me. I wish they'd produced a Mac-only manual and just told me what I was getting, not what was missing. I mean, who wants to go to a baseball game knowing it's going to be rained out?

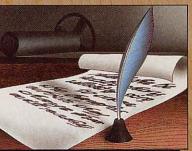
(continues)

The Evolution of CAD

From the beginning of time, man has tried to express himself through graphics.

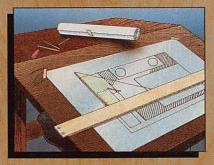
In the beginning man had to use primitive tools for creating graphic designs.





In the 15th Century design tools were quill ink pens and crude styles of paper.

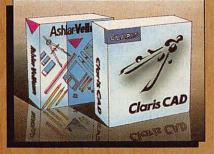
By the 18th Century man had advanced to the drafting table with the T-squares, slide rules, precision ink pens and the dreaded eraser.





In the 20th Century the first CAD programs were very slow and extremely difficult to use, not to mention the expense of buying them.

As programs became easier to use, they thought they were radical and intelligent, but lacked real CAD power.



Now step into the 21st Century...

DesignCAD 2D/3D

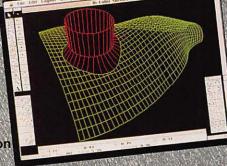
The power of intelligence!

New 3.0 Now Available



- Full 2D drafting
- Floating Point Precision
- Auto Isometric Viewing
- Associative
 Dimensioning
- Tolerance options
- Arrowhead choices
- 256 layers

- Related and Auto Update Windows
- Unlimited color Support
- Fast, Smooth 3D Shading in any view
- Specular
 Highlighting
- Real-Time Rotation
 Unified Bi-Cubic
- surface geometry



- Automatic
 Hidden Line
 Removal in any
 View
- Perspective or Orthographic calculations
- Import & Export DXF, IGES, XYZ Coordinates, & DesignCAD MS-DOS



MACRenderman Compatible

Call or write for FREE BROCHURE & DEMO DISK Phone (918) 825-4848 FAX (918) 825-6359



DesignCAD, Inc.

1 American Way - Pryor OK 74361

End user circle 337 on reader service card

Our Newest Introduction.



Color monitor illustration by Rob Mageira

Since 1985 Ehman has been a leader in providing high quality peripherals to the Macintosh market. Our hard drives, monochrome monitors and removable drives have been a mainstay

DiskDoubler

horses to Capacity of Al Macropan Parts

to the industry, with a name that is well known and highly respected.

Now allow us to introduce the newest

All hard drives come bundled with your choice from two utility software packages and a 2-year warranty.

*Disk Doubler not available with 45MB

member of our family; 20 inches of 8-bit and 24-bit color in high quality, 72 DPI monitors that end users will love, and budget watchers will adore.

The new Ehman 2-page color monitors are as affordable as they are practical. Backed up by a one year warranty and our 30 day money back guarantee, the price tags once again demonstrate Ehman's commitment to value on the most popular peripherals.

The other members of the family are just as cost conscious. From the lightning fast "highly recommended" 660MB drive (*Macworld*, July 91)



No Introduction Needed.

"At \$899, Ehman's Two-Page Monochrome display is an excellent buy."

MACWORLD, MAY, 1991

"If you want a full-page display, we recommend the Ehman: it's rare to find such high quality and low price (\$499) in the same monitor."



Color 20" Monitor 8-Bit \$2,895 24-Bit \$3,895				Monochrome/Gray Scale 19" Monitor Monochrome \$895 Gray Scale \$1,495				Monochrome 15" Monitor \$495						
External	\$129	\$129	\$269	\$289	\$249	\$359	\$319	\$379	\$529	\$789	\$749	\$1,289	\$1,999	\$489
Internal		\$225 \$245	\$245		\$309	\$285	\$335	\$479	\$729	\$699	\$1,245	\$1,949	Removable	
(MB)	800 K	20+	30+	40 EXT	52Q LPS	60+	80+	105Q LPS	170Q	207MX	332W H/H	660WR F/H	45MB	

to our reliable 45MB removable and the popular monochrome monitors, you'll find our prices among the lowest in the industry, and our commitment to quality and service the highest.

Ehman has always had what you want most; affordable quality. Now with the introduction of our 2-page color monitors we also have the full line of peripherals you need most.



Pricing and availability are subject to change without notice.



Call 1-800-257-1666, Fax 1-307-789-4656

Circle 144 on reader service card



Introducing a big improvement over this basic piece of disk handling equipment.

Meet Jukebox Five,™ the handy new disk exchanging machine that takes the manual



Jukebox Five snaps onto your Mac in seconds.

labor out of loading and unloading diskettes. Jukebox Five hooks up to your Mac* in seconds and works its way through a stack of up to 15

disks—automatically. It's the most amazing time-saver since the introduction of the tape drive, without the high price.

Jukebox Five is compatible with virtually

any Macintosh software, including the topselling backup program, Fastback II.™ So unattended disk backups are a snap. And it comes complete with a time-saving utility program that lets you format diskettes,



Load it and leave it to process up to 15 diskettes.

copy from hard disk to floppies and duplicate multiple disks without even being there.

To find out more about Jukebox Five, call 1-800-477-8212. Buy Jukebox Five and get a free box of diskettes. Just write



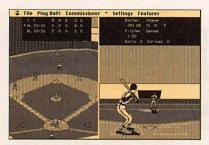
Use it to back up, copy, or format automatically.

"diskettes" on the registration card and return it to us. This is a limited-time offer, so get your hands on one today.

* Fits Macintosh models SE/30, II, IIcx, IIci and IIfx Fifth Generation Systems, Inc. 10049 N. Reiger Road Baton Rouge, LA 70809 Tech Support: (504) 291-7283



Circle 364 on reader service card



Play Ball The stage is set for a match between a team of National League and American League stars from the years 1900 to 1930. In the right-hand pane, pitcher and batter duel; they can be controlled by the computer or the player. The left-hand pane grows larger when the ball is put into play.

The Skies Brighten

Though you do arrive at the ballpark soggy, before long the skies brighten. First, though, Electronic Arts has a special kind of torture for you. It's called the Codewheel-two pieces of round cardboard, one a 1/4-inch larger than the other, fastened together at the center. Each time you launch Earl Weaver Baseball you must enter a number from the Codewheel in order to start the program—Electronic Arts' answer to copy protection. It's fun the first time around; thereafter it is annoying. Lose the Codewheel and the game is over before it begins.

Soggy-and now a bit frustratedyou arrive at the ballpark. But which ballpark? You get to choose from 32 fields. You can, for example, decide to play in Boston's famed Fenway Park, complete with it's imposing "Green Monster" (the 37-foot-high left-field wall).

You can begin the game right away, but most users will probably want to customize the game. Set Ground Rules allows you to choose one of four skill levels, plus make the all-important choice: You Manage, You Play, or Earl Manages. Choose You Play and you get to swing the bat and hurl the ball (with a little help from the keyboard or the mouse). This decision may also make real-time simulation a literal fact, because a You Play game can last almost as long as the real thing. In You Manage and Earl Manages modes you can select an option that allows only one pitch per batter, which greatly speeds up proceedings. Also in the Manage modes you get to make decisions such as whether to steal second or pitch around a batter.

Excellent Animation

The game is played on a split screen. The left pane is an aerial shot of the ballpark and players and includes a working scoreboard—which not only shows the score, but also who is batting, as well as other details of the match. The right pane shows the pitcher and the batter (see "Play Ball"). The animation is excellent and provides for a lot of honest-to-goodness fun and excitement. When a ball is put into play, the aerial view enlarges to fill both panes.

A pitch in Earl Weaver Baseball is made up of three actions controlled by either pressing keys on the keyboard or moving the mouse. One action selects the type of pitch (for example, a fastball breaking to the right), the second selects the location in the strike zone where you want to throw the pitch, and the third initiates delivery (or you can select another option, such as a pickoff attempt). The level of control is remarkable, although in the beginning you'll need to refer to the manual to recall which option is which. Moving the mouse to select options is also an art that takes some mastering.

Instant Replay and Slow Motion Replay let you review a play. And you can take batting and fielding practice, though not, as noted earlier, pitching practice. Earl Weaver Baseball comes with an eight-team Old Timers League comprising the great names of baseball from the turn of the century to 1975. For \$19.95 you can buy a disk containing all 26 major league teams, players, and stadiums from 1989.

There are oodles of statistics to keep the most insatiable stat-head happy. The digitized sounds, though, will please few: a hit ball sounds like radio interference, a home run is greeted by silence, and an umpire growls "Outta there!" But if you're into baseball, you'll suspend disbelief and shelve criticisms. You'll want to try just one more time to get that curveball past Yaz or to launch a bomb over Fenway's "Green Monster." I did.

This is a good program—but it could be a lot better.—Philip Bishop See Where to Buy for contact information.



Networked File-Transfer Utility

MAC-TO-MAC 1.0.1

Pros: Good security options; runs in background; provides messaging capabilities. Cons: Doesn't copy selected folders, only files. Company: Caravelle Networks Corporation. Requires: Mac Plus; AppleTalk network; System 6.0.1; 1MB of RAM; hard drive. List price: 5-pack \$250; 10-pack \$350; 50-pack \$1500; site

licenses available.



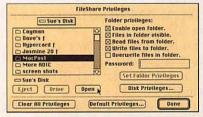
Caravelle Networks Corporation's file-transfer program has many of the features I like

to see in a file-transfer program and will likely give Gizmo Technologies' Send Express a run for its money.

Mac-to-Mac consists of one INIT and two desk accessories, Mac-to-Mac FileShare and Mac-to-Mac TextPhone. The FileShare DA enables you to connect to another Mac on the network and transfer files to and from your Mac. The TextPhone DA is a network "chat" accessory that allows you to trade messages with a remote Mac; TextPhone also includes an answering-machine option for storing incoming messages while you're away from the Mac.

Mac-to-Mac FileShare

The most important part of Mac-to-Mac is the FileShare DA. It has a full complement of folder-based access privileges to protect your files. The most basic level of disk-access control is via a user-defined password. You can assign read-only privileges, and you can set access privileges for indi-(continues)



Setting Privileges Security control is assigned either on an individual folder basis, as shown in this screen, or for an entire disk. You assign disk privileges by selecting the Disk Privileges button in the lower-right corner of the window.



Incomparable Comps.

Outstanding Overheads.





Fantastic Finish.

Standard tabloid

Perfect printing.

Your work deserves it and Color-Master® Plus was specifically designed to deliver it.

ColorMaster Plus has the right resolution: 300 dpi

You get PostScript power: it's 100% Adobe compatible.

For accurate color, it's PANTONE® approved.

Size selection? Letter or tabloid with full bleed—giving you the largest live image of any desktop printer.

Plenty of ports, too. SCSI, Appletalk, RS-232 and Centronics parallel so you can mix and match different computers

New ColorMaster Plus



on one ColorMaster Plus printer.

And all ColorMaster Plus models
come with something you simply can't

get anywhere else: CalComp product quality and long term commitment to service, support and supplies. Our 1-year on-site warranty is just one example

Your incredibly intelligent next step? Call **1-800-932-1212** for more information. In Canada, 416-635-9010.

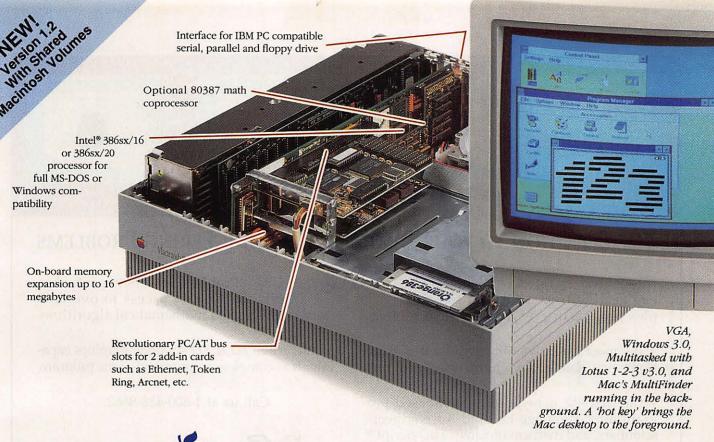
We draw on your imagination.™



A Lockheed Company



Phoenix Page Color is a trademark of Phoenix Technologies, Ltd. CalComp, P.O. Box 3250, Anaheim, Ca 92803. © 1991 CalComp Inc. ColorMaster Plus and We draw on your imagination are trademarks of CalComp. All other product names, logos, trademarks or registered trademarks are property of their respective manufacturers. All images created with Aldus FreeHand and Persuasion software.



Orange 386 MS-DOS Coprocessor

Put a Networked PC Inside Your Mac

... With Unparalleled Network Compatibility

It isn't easy being a Macintosh® user with PC clones networked all about you. Especially if you must run an MS-DOS® based program whose data files are controlled by a network. However, with an Orange 386 card *inside* your Mac, you can directly connect to any PC dominated network with complete compatibility.

How? Simply put an Ethernet, Token Ring, Arcnet card, etc., into a PC/AT slot located on the Orange386, and run your networked PC program. The Orange386 provides the ideal connection to the network, and its built-in Intel® 80386 processor and on-board RAM ensure that your MS-DOS programs run properly.

... Run Your Critical PC Software

The Orange 386 is actually a second computer functioning independently *inside* your Macintosh. In VGA mode for example, you could be running an MS-DOS based program such as MS-Windows®, while simultaneously executing a Mac program. A 'hot key' moves you back and forth between platforms in a true dual processing environment.

... With Superior Hardware Performance

With Orange386 your choices are: 16 or 20 mhz SX processor, up to 16 MB RAM, optional Intel 80387 math coprocessor, PC serial port, PC parallel port, PC floppy disk port, and two PC/AT expansion slots for VGA, network cards, etc. The Orange386 offers an environment of virtually unlimited hardware flexibility. But more importantly, your MS-DOS software will execute up to 10 times faster with the hardware based Orange386 as compared to PC software emulation packages.

For the ultimate in MS-DOS compatibility, put a PC network *inside* your Mac with Orange386.

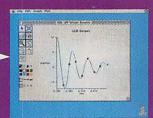
Upgrade Your Mac286 to Orange386

Contact Orange Micro Sales for details (714) 779-2772

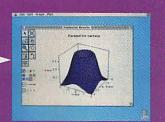


"11 Years of Innovation and Excellence" 1400 N. Lakeview Ave., Anaheim CA 92807 (714) 779-2772









HiQ's Problem Solvers automatically generate 2D or 3D graphical plots that can then be interactively edited as well as animated.

THE SOLUTION TO YOUR REAL WORLD ENGINEERING PROBLEMS

Integrated in one system – all the engineering tools you need for complex projects or everyday problem solving:

- the most extensive library of built-in functions available in any engineering program
- the first 4th generation, object-based programming language tailored for engineers, scientists, and mathematicians HiQ-Script™
- HiQ's Problem Solvers™ intuitive interfaces for easy access to over 100 very sophisticated mathematical algorithms
- interactive 2D & 3D scientific graphics capabilities as complete as any stand-alone program

Call us at 1-800-488-8662.



Bimillennium Corporation • 101 Albright Way, Los Gatos, CA 95030 • 1-800-488-8662

First in Power Computing Software

Circle 233 on reader service card.



The Desktop Technical Support Application

Your system bombs when you try to print. You get an error message when you try to open an application. Or your screen locks up when you try to use a desk accessory.

Now there's Help!. Help! is a personal diagnostic application which solves MacintoshTM system configuration problems.

Help! analyzes your system, detects problems and tells you how to fix them! And Help! makes switching to System 7.0 easy!

Help! was designed with all Macintosh users in mind from beginners to experts. And if you're responsible for helping others, Help! can reduce your support costs by helping your users support themselves.

Help! is only \$149 or \$795 per 10-pack with volume discounts and site licensing available. If you need Help!, order directly from Teknosys by calling **(800) 873-3494.**





3923 Coconut Palm Drive, Suite 111 Tampa, FL 33619 phone: (813) 620-3494 fax: (813) 620-4039

© 1991 Teknosys, Inc. All rights reserved. The Teknosys and Help! logos are trademarks of Teknosys, Inc. All other brand and product names are trademarks or registered trademarks of their respective manufacturers.

Duplicate files

Conflicts

The INIT Adobs Type Manager is known to conflict with the application Illustrator 88 1.83.
This conflict can be resolved by upgrading to Illustrator 88 1.83 or later. Contact Adobe at (415) 961-0911 for upgrade information.

The INIT Rival 1.1.6 is known to conflict with the INIT DiskDoubler 3.1.
This conflict can be resolved by upgrading to DiskDoubler 3.1, 1 or later. Contact Salient Software at (415) 321-3375 for upgrade information.

Incompatibilities

The application Disk First Aid 1.4.3 is not compatible with System 7.0.
System 7.0 requires Disk First Aid 1.5 or later. Contact your local Apple dealer for upgrade information.

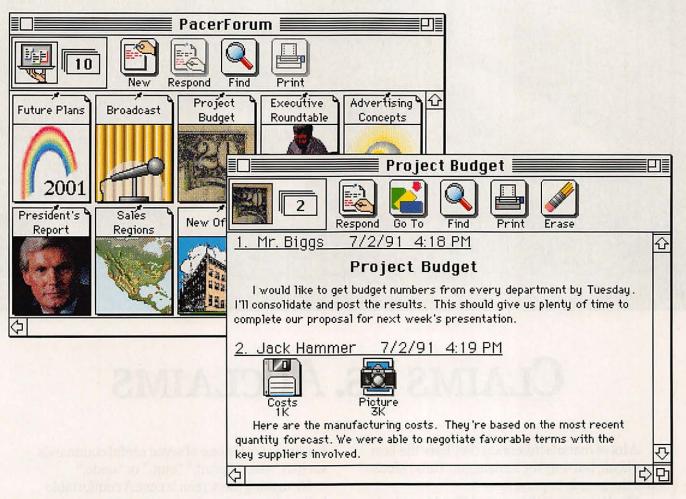
The application Font/DA Mover 3.8 is no longer needed because its functionality has been incorporated into System 7.0.
Vour lary waint to remove the application Font/DA Mover 3.8 from your hard drive to save disk space.

Duplicate Files

You have 2 copies of the application TeachText 1.1 on the volume HD.40. They can be found in the followed to the properties of the specification TeachText 1.1 on the volume HD.40. They can be found in the

HD40:System Folder:Aldus Folder:TeachText HD 40:Applications:TeachText

Get Your Workgroup Working.



PacerForum is Here!

Whether you're broadcasting a bulletin or brainstorming a winning concept, PacerForum makes it easy to collaborate and communicate. All without leaving your Macintosh—or your application.

PacerForum is an interactive networked bulletin board that lets you post notices and solicit responses from your co-workers. You can announce the latest company news. Develop a design. Or monitor a schedule. All in a simple, organized fashion.

Using a colorful graphic interface, PacerForum lets you attach files, pictures and sounds to create multimedia messages that get results – fast. It's the ideal way to distribute software updates, send

documents through the approval cycle and build collaborative lists.

No matter how diverse your workgroup may be, PacerForum brings everyone together in a structured, secure conferencing environment. All you need in common is an AppleTalk network and a desire to communicate more efficiently.

To learn how PacerForum can put your network to work – and pull your workgroup together – contact your local Pacer dealer or call us at 619-454-0565.



CLAIMS Vs. ACCLAIMS

A lot of manufacturers say they have the best trackball, but only the Kensington Turbo Mouse® has the awards to prove it.

MacUser gave it the coveted Five Mice. And the readers of Macworld magazine voted it "Best Input Device" — not just once but *four years in a row*.

What makes Turbo Mouse outshine the rest? Superior optical hardware and unique software are the difference.

A light click sends the signal quietly and instantly.

One button transmits a normal mouse command. The other locks the button in the



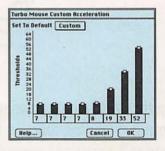
down position for extended selection and graphic applications. You decide which button performs what function.

Press both buttons simultaneously, and our time-saving chording feature executes one of seven useful commands such as "save," "print," "quit," or "undo."

Navigating the screen is easy. A comfortable ball position makes the cursor easy to move.

And a smooth ball movement means no jumping or sticking.

What's more, Turbo Mouse has unique software that lets you adjust both acceleration and double-click speed to exactly match the



way you work. Move the ball slowly and the cursor moves pixel-by-pixel. Move it fast and it speeds across even the biggest screen.

The next time you read another claim for a trackball, remember the one that has earned all the acclaims. Turbo Mouse.

For a free brochure, and the dealer nearest you, call 800-535-4242. Outside the U.S.A., call 415-572-2700.

Dealers circle 180 on reader service card End users circle 181 on reader service card KENSINGTON.

vidual folders, but not for files (see "Setting Privileges"). The privileges parallel those used on AppleShare servers—open folder, view list of files

in folder, read files from folder, write files to folder, and overwrite files in folder. In addition, you can protect individual folders with their own password.

I tested Mac-to-Mac over Ether-Talk and LocalTalk networks. Even on LocalTalk networks, the speed of file transfers was adequate. And the fact that Mac-to-Mac operates in the background makes it a handy way to transfer files between Macs.

The file-transfer interface resembles that of Apple's Font/DA Mover. Your Mac's disk appears in one window, and the remote Mac appears in another window. You simply shiftclick to select the files to be transferred, select the destination folder (by opening it on the remote Mac window), and start the transfer. You cannot transfer an entire folder's contents by selecting the folder, however. According to the company, the next version of Mac-to-Mac will include an option to transfer an entire folder. You can create new folders on the local and remote Macs to handle any new files. Mac-to-Mac's logging option keeps track of all files sent and received while you are away from the Mac.

I did, however, run into a problem on occasion. Mac-to-Mac did not know that it had completed a session. After completing a file transfer, I disconnected the Mac, but the remote Mac behaved as if it were still connected (a flashing icon at the Apple menu indicating that the remote Mac is busy). When I tried to reconnect to the remote Mac, I received a message that it was still engaged in a session.

Mac-to-Mac TextPhone

Mac-to-Mac supports an answering machine for phone-style text communications. With the answering-machine feature, callers can leave text messages that you can read later. TextPhone also has the ability to use MacinTalk to "speak" your messages to you. Since it uses MacinTalk, not everything is fully understandable unless you read the message at the same time.

What It's Not

Mac-to-Mac is not a substitute for a file server or a peer-to-peer network operating system. It's a file-transfer utility. If you want to work with a file, you must transfer it to your Mac. You cannot keep one copy of a file in one location and share usage across the network.

And TextPhone is not a substitute for an E-mail system. It's meant for one-on-one communications and requires that both Macs (sender and receiver) be turned on in order to work. TextPhone's answering-machine feature makes it more useful than an ordinary phone or chat application, though.

Even with an AppleShare file server on our network, I found Macto-Mac to be a useful adjunct, especially when I am looking for a file that is on someone else's Mac.

—Dave Kosiur

See Where to Buy for contact information.

Small-Business Accounting Software

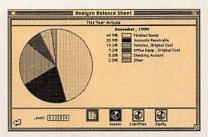
M.Y.O.B. 2.0

Pros: Provides flexible invoicing; inventory record keeping includes ability to account for manufactured items. Cons: No payroll module.

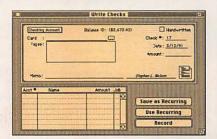
Company: Teleware. Requires: Mac Plus; hard drive. List price: \$249.

Tired of running your business out of a shoe box? Or (0) By with one of those easy-to-use checkbook programs that don't actually do much? Maybe it's time you stepped up to a real business-accounting program—one that generates standard business forms, keeps detailed records of your assets and liabilities, and uses double-entry bookkeeping to produce accurate financial statements. M.Y.O.B. 2.0 includes five basic modules-Checkbook, Sales & Receivables, Purchases & Payables, Inventory, and General Ledger.

The Checkbook module essentially works like a computerized checkbook: you record checks in a window that resembles a check, and you record deposits in a window that resembles a deposit slip. M.Y.O.B.



Balance Sheet M.Y.O.B. gives you the option of producing such financial statements as a balance sheet in both tabular and graphical form.



Writing Checks You use this window to record your checks.

updates checking-account balances, prints checks, and records income and expense amounts. Business owners can start off using just the Checkbook. However, if you just want automated check-writing, you'll probably be happier with a checkbook program like Intuit's Quicken (\$59.95).

The Sales & Receivables module generates customer invoices and monthly statements. It also tracks unpaid customer invoices and payments. M.Y.O.B. includes two invoice forms: one for products sold and one for services provided. Also, you can choose whether to print invoices on preprinted forms or on your own business letterhead.

The Purchases & Payables module is basic, but it does everything most businesses would ever need: it generates purchase orders, tracks unpaid vendor invoices, and lets you set up invoices for paying vendors—something you'll do later with the Checkbook module.

The Inventory module provides some handy inventory-management tools. It keeps detailed records of both the dollar value and the units of inventory. And it lets you easily price and reprice items. The module even has a simple bill-of-materials feature called Autobuild. Autobuild, usually used by manufacturers, records si-(continues)



Power.

The power of creativity.

Multimedia presentation. Digital audio or video. Desktop publishing. Computer-aided design. Education. Networking.

No matter what you do, you're expressing your creativity through your Macintosh. So don't limit your capabilities – enhance them with a full range of powerful storage solutions from Microtech International.

The power of choice.

You can choose the perfect high performance solution from Microtech's line of award-winning products. The Nova Series of Microtech hard drives has it all – size, speed and reliability. Including up to 1GB of storage capacity, as low as 16ms access times and a five year limited warranty. And Microtech's R50 removable cartridge drive offers you the convenience of transportability.

Choose the endurance and stability of optical storage with Microtech's OR650 magneto-optical disk drive or the CD600 CD-ROM drive. Our T1200 tape backup unit provides a cost-effective way to store gigabytes of data off-line.

As a power user, you can count on Microtech to bring you the latest technology in memory solutions. Our 4MB and 16MB modules give your computer the power boost you're going to need with System 7.0.

The power of Microtech.

Power without dependability is no power at all. Since 1985, Microtech's *Commitment to Quality* has meant reliable products backed by the longest warranties in the industry. Our dedicated service and support team are winners of *Macworld Magazine's Service Hero Awards* and ensure your satisfaction – guaranteed.

When you need quality, performance, value and service, don't be misled by false promises. Only one name gives you the power. Microtech International.

Now distributed by Ingram Micro

Call for your nearest dealer **1-800-325-1895**International inquiries call: 203-468-6223 (FAX 203-467-8124)

Circle 80 on reader service card



multaneous decreases and increases in different inventory items. For example, a business that makes skateboards out of roller-skate wheels and mahogany planks decreases its inventory of roller-skate wheels and mahogany planks and increases its inventory of finished skateboards whenever it manufactures its product. Autobuild can record all these changes in one fell swoop. One noteworthy weakness of the Inventory module, however, is that it forces you to use the average cost per unit to value your inventory-this can be a problem if you want or are required to use another costing assumption, such as last-in-first-out (LIFO) or firstin-first-out (FIFO).

Finally, the General Ledger module acts as a central repository of financial information. It collects information from all the other modules and lets you enter any additional financial data—for example, money borrowed from a bank, stock sold to investors, or asset depreciation. The General Ledger then uses all this information to prepare the balance sheet, which lists assets and liabilities: and the income statement, which calculates profits and losses. The program does not prepare the third standard financial report, the cash-flow statement, but this omission isn't as remarkable as it sounds. Cash-flow statements are notoriously difficult to prepare with a computer and are usually available only with accounting programs that have built-in report writers.

Besides the five basic accounting modules, M.Y.O.B. also provides Administration and Card File modules. The Administration module defines miscellaneous accounting settings such as your company name, your M.Y.O.B. password, and the beginning and close of your fiscal year. The Card File module maintains an address list of the people with whom you do business, so that after you enter a name on checks, purchase orders, invoices, and statements, the person's address automatically appears. You can also use the Card File to print mailing labels.

Given these features, then, who should use M.Y.O.B.? As a C.P.A., I recommend the program to small

businesses with, say, somewhere between \$200,000 and \$1,000,000 in sales. Businesses of this size usually need more than just a computerized checkbook, but they don't need all the horsepower of a fully featured business-accounting program like the Great Plains Accounting Series. In comparison, businesses doing less than \$200,000 in sales probably don't need to bother with a system that uses double-entry bookkeeping. But businesses with more than \$1,000,000 in sales will want an accounting program that has a few more features.

-Stephen L. Nelson

See Where to Buy for contact information.



Graph-to-Number Converter

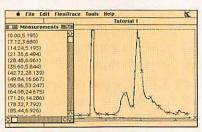
FLEXITRACE 1.01

Pros: Detailed numerical analysis
of published charts and graphs; excellent help and tutorial. Cons: Can't
read some murkily printed color area
charts. Company: Tree Star.
Requires: Mac Plus. List price: \$249.

T

A few years ago Tree Star introduced its first product, the novel program FlexiGraph.

FlexiGraph (\$149) lets you draw line, pie, or bar charts freehand, and then converts the artwork into a table of numbers. Besides its legitimate uses, FlexiGraph provided a stern test of character, making it simple to fudge business or scientific results. As if to restore the karmic balance, Tree Star has introduced FlexiTrace, a program that lets you check published data by converting scanned charts to tables of numbers. You can scan charts from scientific or engineering jour-



X and Y Mark the Spot This screen shows the numeric table FlexiTrace produced from the graph at right. The program is adept at filtering grid lines, speckles, and tilts from the original artwork as well.

nals, pen-and-ink-based scientific chart recorders, the stock market pages, or newsmagazines.

Tree Star's execution of the concept is remarkably clean. Basically, you scan a chart into FlexiTrace as a 72-dots-per-inch PICT or MacPaint file. To clean up most scanned graphs, FlexiTrace removes little spots, spikes, and unwanted grids, and smooths data. You then redimension the graph if necessary (or select log coordinates), pick a sampling rate, and invoke the Trace command. The program outputs an x, y table as tabbed text to the Measurements window (see "X and Y Mark the Spot"). The captured data can be sent to the Clipboard and then to a spreadsheet or statistics program. You can also override the trace function and direct the program to measure areas and distances between points.

Interpreting Charts

Tree Star clearly experimented with hundreds of scanned graphs in working out its filtering algorithms. A smudged 2-by-2-inch stock chart from an ancient Value Line review yielded clean data, and a scatter chart with six types of nearly indistinguishable tiny markers was also successfully interpreted (after doing some hand tinkering while following FlexiTrace's manual). As the quality of your scans gets worse, they necessarily become harder to trace. For example, a photocopy of a multicolor area chart that comes out looking like layers of mud isn't easily scanned and interpreted.

If you want to investigate business trends from data in journals or newspapers, FlexiTrace is exactly what you need (along with a scanner and a good regression program). If you want to digitize precomputer instrument scans, spectra, pen plots, or chart-recorder output from various devices, FlexiTrace is effectively your only convenient choice. And if you want to scrutinize published research results, the program is invaluable. The company that developed a product that could be abused as the slickest way to fake data has now completed the cycle by offering a program that's the best way to keep everybody honest.

-Charles Seiter

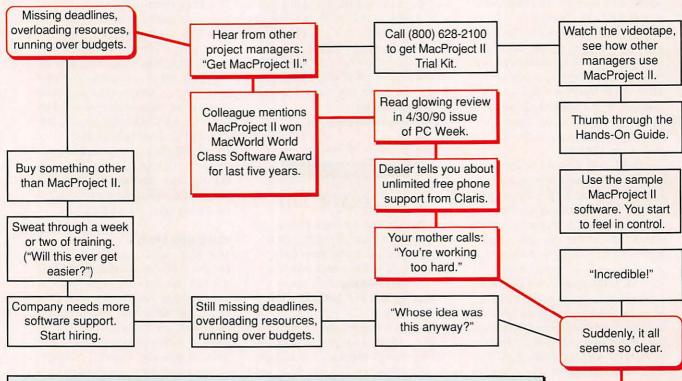
Application

MacWrite II FileMaker Pro

MacProject II

MacDraw Pro
Claris Resolve
HyperCard
Claris CAD
SmartForm Series
MacPaint

Why 9 out of 10 project managers choose this path.



The Leader



Oh sure, a few take other paths. But for 92%* of those who buy project management software for the Macintosh, all roads

lead to MacProject® II software.

Right out of the box, MacProject II will have you scheduling, managing, and controlling projects of any size. Even if you've never so much as blinked at this kind of software before.

Yet, there's nothing simple about its capabilities. There's no limit to the number of tasks, subprojects, resources, and customized resource calendars you assign to a project.

On a network, MacProject II lets dif-

ferent people update their own subprojects, all linked to a master file that can be reviewed by the entire project team.

Another exclusive MacProject II fea-

ture – Interactive Resource Leveling – practically eliminates the possibility of overloading your staff.

You can create custom graphs and

reports through direct links with the new Claris® Resolve™ spreadsheet.

Why not experience the power of MacProject II for yourself? Order your own trial kit, now.

The Offer

MacProject II Trial Kit.

Includes video, sample software, and tutorial guide.
All for \$24.95.†

Call 1-800-628-2100, ext. 65.

CLARIS*

Simply powerful software.™

*Source: International Data Corporation, April, 1990. †Refundable by Claris with proof of purchase of MacProject II.

Offer to purchase MacProject II Trial Kit good in U.S.A. only and expires June 30, 1992. ©1991 Claris Corporation. For more information call
1-800-729-2292, ext. 30. In Canada, call 1-800-668-8948, ext. 48. Claris, FileMaker, MacDraw, MacPaint, MacProject, MacWrite and
SmartForm are registered trademarks, and Resolve and "Simply powerful software" are adaemarks of Claris Corporation. HyperCard is a registered trademark of Apple Computer, Inc., licensed to Claris Corporation. Macintosh is a registered trademark of Apple Computer, Inc.,

Public Utilities

SHAREWARE PRODUCTIVITY-ENHANCERS GROW UP

BY DAVID POGUE

o wonder commercial software developers command 3-digit prices. After all, they have to pay for the programmers, the lawyers, the ads, and the phone calls. And 50 cents for the disk. On a budget? Go generic. In the software world they

call it *shareware;* in many cases it is written by the same programmers who write commercial software. But because you get shareware from online services like America Online or CompuServe, you don't pay for manuals, mailing, or marketing—you don't even pay for the disk. You just send the programmer the requested token of appreciation: maybe \$25, maybe a postcard.

You might notice that this month's column doesn't seem to include any dogs; that's because all these programs are either popular online or ultra-useful, and I consider them grossly underpublicized. You can download these from America Online, CompuServe, or almost any other online service, or you can get them from a user group.

Switch Boot 1.0

Are you cautiously trying out System 7 but finding yourself switching back to System 6.X frequently (because some program is System 7–shabby)? Then you're probably spending half your life opening the Startup Disk control panel to switch partitions or hard drives.

Not anymore. Switch Boot (by John Mancino, free) is an INIT whose window appears when you press the S key while the computer is starting up. It lists all your volumes or partitions. Select the one you want to boot

from, and hit the enter key. That's it—no control panel, no fuss. Switch Boot even has a Shut Down button in case you're overcome with indecision and want to forget the whole thing.

Compact Pro 1.30

Compact Pro (formerly Compactor) is like StuffIt: it encodes any file or folder into a compressed format called an *archive*. Archives usually take up much less disk space than original files and take less time to transmit with a modem.

But Compact Pro (Bill Goodman, \$25) is more efficient—it takes less time to compress a file by the same amount—than StuffIt Classic or Stuff-It Deluxe. For better or worse, Compact Pro also has far fewer options, making it easier for many of us to use. Furthermore, the clarity of the manual runs circles around many commercial manuals.

Compact Pro can make self-extracting archives that expand when double-clicked (adding 13K to the archive's size). And under System 7 or with MultiFinder, Compact Pro compresses in the background.

The commercial, INIT-based compression programs DiskDoubler and SuperDisk compress more efficiently still, and decompress files on the fly (without requiring a trip to an application). But for the money and the simplicity, Compact Pro is it.



Pixel-Flipper 1.3

If you own a color or gray-scale monitor, you probably know how to change it to black and white: open the Control Panel, wait, click on Monitors, wait, and so on. There had to be a better way. First there was Switch-A-Roo, a nifty, free shareware F-key that switches between two color depths (say, black and white to 256 colors) when you press a key combination.

But now there's the Pixel-Flipper cdev, which is more useful yet (Chris Sanchez, \$10). Instead of toggling between just two settings, Pixel-Flipper pops up a menu anywhere you click, from which you choose any setting: black and white, 4-bit, 8-bit, whatever. If you have multiple monitors, you can change each one independently. In any case, Pixel-Flipper is fast, slightly less awkward to use than an F-key, and about a million times more convenient than the Control Panel.

RamDisk + 2.11, AppDisk 1.2

A RAM disk, you might say, is the flip side of virtual memory; it treats mem-(continues) ory as disk space, while virtual memory treats disk space as memory.

RAM delivers information to the Mac dozens of times faster than a physical disk can; anything you put onto a RAM disk, therefore, runs much faster than it normally would—perfect for programs that access the disk a lot.

RamDisk + (Roger Bates, \$20) is the best RAM-disk shareware program because you can set it to autocopy a set of files onto the RAM disk it creates. It also has online help, a good sense of humor, and clearly the most sophisticated programming. Bummer: it doesn't run under System 7.

For 7-savviness, you will want the clever AppDisk program (Mark Adams, \$15). The Mac thinks AppDisk is just another open application—so you can "eject" your imaginary disk just by quitting AppDisk. A feature that autosaves your data back onto a real disk makes AppDisk safer than most RAM disks.

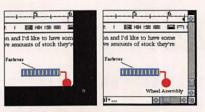
MaxAppleZoom 1.3

This cdev (Naoto Horii, \$25) works only on single-monitor Mac II systems using a 4- or 8-bit Apple Display Card and the standard Apple 13-inch color monitor. Put MaxAppleZoom (MAZ) into the System Folder and try not to let your jaw hit the floor.

You know the ¾-inch black band around the perimeter of a monitor? MAZ eliminates it, filling every single pixel behind the glass with usable image, right up to the plastic collar. Suddenly you've got a 704-by-512-pixel screen instead of 640-by-480—as though you traded up to a monitor that's 17 percent bigger.

Other than your mood and productivity, this masterpiece doesn't affect a thing: software and hardware never know it's there. (On my Mac, MAZ even likes System 7.) Makes you wonder: if all of that screen area is usable, why does Apple leave the dark border around the edges?

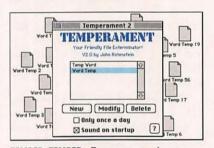
If you're already a MAZ user, you discovered that the program abruptly stopped working one day this summer. By the time you read this, MaxAppleZoom 1.4 may have been released—or the geniuses of the shareware world may have written a patch that brings 1.3 back to life.



THE BIG SCREEN MaxAppleZoom substantially increases the amount you can see on a Mac II monitor by eliminating the black band all the way around the screen (before, left; after, right).



SCSI SLEUTHS In the event of a SCSI snafu, cdevs can be invaluable. SCSIInfo (above) gives more details, but SCSIProbe gives you better information on your SCSI universe.



TEMPER, TEMPER Temperament, whose control panel is shown here, cleans up after Microsoft Word. You can even teach it to delete the detritus from other programs.

QuitFinder FKey 1.2

The Finder is really a program, just like PageMaker or MacPaint. What MultiFinder does is run the Finder and other programs simultaneously, so you can rotate among them easily.

But for owners of 1- or 2-meg Macs, if the Finder is hogging a whole program's worth of memory, what's the value of MultiFinder? That's where QuitFinder steps in (Eric C. Thauvin, free). It's an F-key; you install it with Suitcase II, MasterJuggler, or a shareware FKey installer. When you press

#.shift-0, the Trash Can disappears—you've just quit the Finder, safely and easily, just as you'd quit any other program. You're left aloft in your chosen programs with lots more memory available. When you cycle through the open programs, you never have to slog past the Finder.

When you quit everything, the Finder safely relaunches itself. The only wrinkle: to launch new programs, you have to use On Cue, Hand-Off, DiskTop, or another file-launcher. Otherwise, QuitFinder gives new hope to owners of 1MB Macs, and new memory to everybody else.

SCSIInfo, SCSIProbe

Crisis quiz: You power up the Mac, but the hard drive icon doesn't appear. Who ya gonna call?

For starters, call up SCSIInfo (Bob Easterday, pay what you want). It's a SCSI detective; it tells you the make, model, capacity, partition info, and SCSI address of every SCSI device attached to the Mac (addresses 0 through 6), and more. It has a Mount button that can often bring a SCSI device that's acting flaky online (SCSI is like that).

Without SCSIInfo, you'd be utterly at a loss to know why a drive isn't mounting; the cdev at least tells you whether the Mac is "seeing" a drive, giving you a head start in solving the problem. You might prefer the cleaner-looking SCSIProbe (Robert Polic, free); while it omits some of SCSIInfo's info (such as Interleave and System Version), it does display all seven SCSI addresses, including that of your ever-lovin' Mac, which is always at position 7.

Temperament 2.0

Okay, there's not much to this cdev (John Rotenstein, free). All it does is sit there and devour all those Word Temp files that Microsoft Word leaves in its wake.

Can you imagine a big software company wasting its time writing something this simple and this good? No way.

Contributing editor David Pogue is an efficiency addict, utilities fiend, and shareware junkie in Manhattan.



This printer is so fast it knocks out the competition cold

Lease Only 564/Mo

PRIZE WINNING

- 35 resident fonts
 - Mac/DOS compatible
 - 2 MB RAM upgradeable to 10
 - Compact design
 - SCSI port for adding a hard
 - · Auto switch between 4 optional paper trays

Panasonic Laser Printer...52,088

This Panasonic KX-P4455 laser printer includes 2 paper trays, genuine postscript, 11PPM, Appletalk & cable. This one's great!

Epson Laser Printer...52.188

The Epson 7500 features genuine postscript and Microfine toner for the blackest black we've ever seen!

Olympia NP60 Dot Matrix Printer... 288

Great home, school, light duty, check printing and label dot matrix printer. 100% Mac compatible... Buy 2!



See more than just black & blue! 256 colors

to catch all the action!

MAGNIFICEN

19" Color Monitor

Incorporating SONY'S patented Trinitron technology complete w/cable and tilt swivel.

75 Hz Refresh Rate

& Stuff

BRAINS and brawn is a

tough combo to beat!

- 1024x768 Display
- **72 DPI**

E-16 Color Monitor....51,088

This 16" monitor from E-Machines works with on-board video. 640 x 480, 60 dpi.

T-16 Color Monitor...\$1,688

1 award winning monitor from SONY. Monitor only.

13" Color Monitor...:648 Genuine SONY. This is the original multi-sync!

HEAVY HITTING

And in this

corner... the perfect match

for your Mac

That fit your Mac System like a glove!

Heavyweight capacity hard drives at featherweight prices! 40 MB Only

This 40 MB hard drive with genuine Apple mechanism is a true champion! And at this price you better not wait 'til the final round!

Syquest 45 MB Removable...\$588

20 ms, Great for back up, 2 year warranty.

105 MB HD...\$499

Quantum mechanism, 12 ms access time, LPS series, 2 year warranty.

Unique dual drive technology is great for back up. This one's really neat... Call!

MB Fast 80 ns

"Floats like a butterfly, stings like a bee"... our RAM is faster than Muhammad Ali!

Quickor Power Supply....9188

For 128, 512, Plus, SE, & SE30. 1 year warranty. Includes return shipping (compare \$350 at your local dealer!)

800K Drive Replacement...5148

Original SONY mechanism. I year warranty.

SE/20 HD Repair/Upgrade...⁵248

We'll install a genuine Apple 40MB drive. Return shipping included. 1 year warranty.

MacFriends K.O.s the competiton!

- Knowledgeable Staff!
- 1000's of products!
- Lowest prices!
- Superior service!
- · Fast delivery!

Service

perfect winning match for your Mac system Call MacFriends today!

Call Toll Free Today!

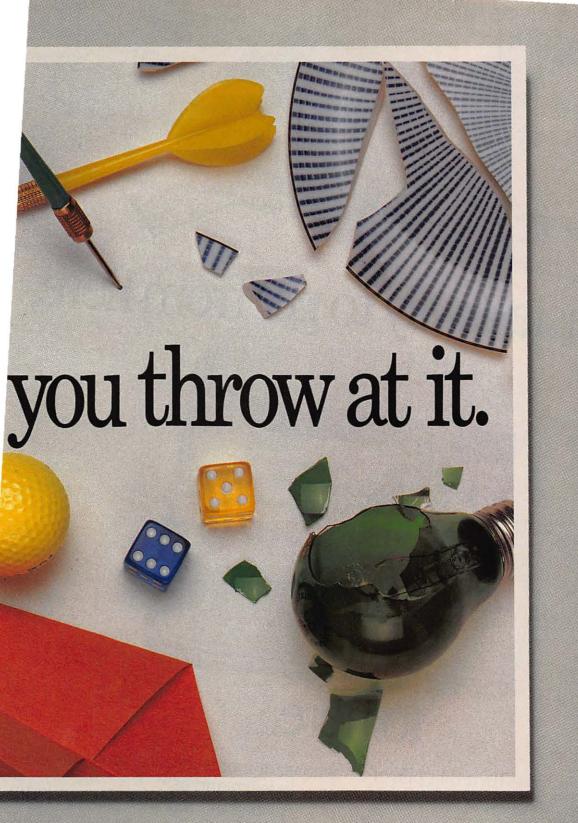
24 HOUR QUICKFAX (503)255-0067 LOCAL: (503) 254-6800











Let's say you have this outrageous design. But your color printer just doesn't get it. Looks like a job for the new Phaser™ III.

It has the broadest range of colors available—16.7 million of them—all delivered at 300 dpi with TekColor™ and Pantone-approved color matching. You'll get brilliant color on any paper, from stationery to card stock. And it takes up to 12" x 18" so you

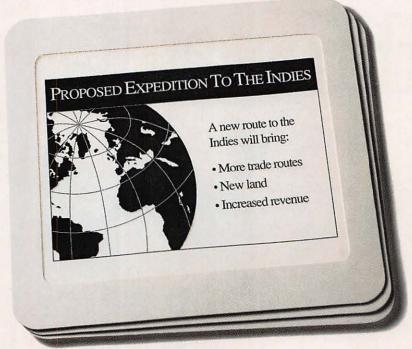
Ten MB RAM and a 24 MHz RISC chip make it the fastest printer controller around. And with Adobe's PostScript™ Language Level 2, your stuff will look great.

So go ahead. Throw out the wildest idea you can think of. The Phaser III can take it. Call 1-800-835-6100, Dept. 17C for a free output sample.





The easiest way to get from here,



to here.



Turn that pile of notes, reports and old slides into your most convincing presentation ever. With Microsoft PowerPoint. It has all the tools you need to make terrific overheads,

slides and handouts.

We designed PowerPoint software especially for business people like you

who want a presentation program that's easy to learn and use.

Sound interesting? Just call (800) 541-1261, Dept. Q60, for the name of your nearest Microsoft reseller. And change that mess on your desk into a masterpiece in the conference room.

Microsoft Making it all make sense



NEW PRODUCTS

Edited by Mary Margaret Lewis

This section covers Macintosh products formally announced but not yet evaluated by Macworld. All prices are suggested retail. Please call vendors for information on availability.

HARDWARE

BLP Elite Printer

PostScript printer that comes with 17 PostScript fonts, 2MB of RAM, and built-in AppleTalk for sharing files over a network. Provides a control panel for configuring the printer and for monitoring its status. Has user-adjustable sleep mode. \$1599. GCC Technologies, 617/890-0880.



BLP Elite Printer

Character Scanner

Full-page desktop scanner that functions as sheetfed and hand-held scanner. Compatible with all major



Character Scanner

OCR software. Scans in 64 levels of gray, and has selectable output resolution of 100 dpi to 400 dpi. \$599. Computer Friends, 503/626-2291.

The ColorArtist Scanner

18-bit color/gray-scale hand scanner that provides 400-dpi gray-scale resolution. Comes bundled with RainbowPaint color-paint and imaging software. \$795. Marstek, 714/833-7740.



The ColorArtist Scanner

Laser Access Switch

Autoswitch that allows two to four Macs to share printer or other peripheral. Bidirectional switch enables one computer to share up to four peripherals. Can be used in conjunction with line extenders and buffers. Four-port parallel model \$169.96; two-port parallel model \$119.95. Solectek, 619/450-1220.

LightningScan Compact

Portable scanner that connects to disk drive port. Device weighs 5 ounces and is slightly larger than a deck of cards. Includes SnapGuide scanning guide



LightningScan Compact

that prevents side-to-side swaying. Scans images up to 4.2 inches wide and has settings for 100, 200, 300, and 400 dpi. Comes bundled with ThunderWorks image-editing software and desk accessory for scanning graphics or text from within any application. \$369. Thunderware, 415/254-6581.

Ovation Projection Panel

Color LCD projection panel capable of displaying live video without an add-in computer video board or external adapter boxes. Permits connection of optional powered speakers. Sound level from a VCR or other audio source can be adjusted from the bundled Ovation hand-held remote control unit. Works with Mac and IBM-compatible personal computers. \$8495. Proxima Corporation, 619/457-5500.

PassProof for the Mac Ilsi

Data-security hardwaresoftware combination that

consists of PassProof software disk, lock that fits in disk drive, two keys on a key ring with a serial-number tag, floppy-port plate, SCSI-port plate, tamperproof Mac II case screw, tamper-proof plate screws, and a custom screwdriver. A hardware-locking device, a round key-lock, prevents physical access to the Mac's drive. Metal security plates prevent floppy and SCSI port access. Software protects against unauthorized system access and contains password protection, screen-locking, and user-access tracking features, 1MB min, memory. \$99.95. Kensington Microware, 415/572-2700, 800/535-4242.

Platinum 400MB Hard Disk Subsystem

Internal and external 400MB mass-storage subsystems. Internal version is fully compatible with Mac Ilcx and Ilci computers. Includes CMS SCSI utilities 6.0, which supports passwords, partitioning, and A/UX; Symantec's SUM II utilities for data recovery, data encryption and backup; documentation; and a one-year warranty. Internal model \$3799; external model \$3999. CMS Enhancements, 714/222-6000.

Workgroup Laser Printer

10-pages-per-minute laser printer with 50 resident Hewlett-Packard Series II (continues) fonts, dual-bin paper handling, and custom controller. Can be upgraded to PostScript page-description language compatibility. Designed for the needs of small to medium-size workgroups, and comes with two board slots that can accommodate a full library of HP-compatible fonts on smart boards. \$2595. Mannesmann Tally, 206/251-5653.

SOFTWARE

Edit Master Mac

Computer-based videotape-editing system for professional video editors. Offers pull-down menus, 999-event dual-list management and cleaning capability, and ability to create lists in a variety of formats. Provides sync roll recording and dynamic tracking. Also provides longitude timecode and vertical-interval time-code frame editing. 2MB min. memory. \$4500 to \$16,000, depending on configuration. CV Technologies, 201/784-3355.

EPS Exchange

Utility that allows user to import Aldus FreeHand 3.0 drawings into Adobe Illustrator 88 and Illustrator 3.0 for editing and printing, while retaining details of original artwork. 1MB min. memory. \$149. Altsys Corporation, 214/680-2060.

GeoVista

Presentation software for creating maps representing geographic areas within the United States. Maps can be used to display sales, marketing, and demographic information. Enables user to enter information directly from the keyboard, or to display information contained in any major database or spread-

sheet. Maps can be exported in Paint or PICT format, or printed directly by GeoVista. 1MB min. memory. \$249. Newton Technology, 617/630-0145.



GeoVista

Golf Teacher

HyperCard-based golf tutor that incorporates animation, text, and sound to increase user's knowledge of playing golf. Explores basics of the game, covering grip, swing, hooks, and slices, as well as advanced techniques used in short game, sand play, and putting. 1MB min. memory. \$34.95. FYI Publishing, 817/599-3362.

Harbor Master

Software for predicting ocean tides and tidal currents. Displays information about tidal currents at 2900 tide locations worldwide, including 2300 locations in the continental United States, Alaska, and Hawaii. Has an option to display multiple tide tables, calendars, and graphic windows. Has a toggle switch to move between standard time and daylight time, the ability to display the tide table or current data in a calendar format, and an option to save annotations to text files, and graphics to PICT format. 1MB min. memory. \$149. Zihua Software, 408/372-0155.

Help

Utility for diagnosing Mac configuration problems. Analyzes hardware and software configuration to detect potential or existing problems, and suggests actions to fix any detected problems. Generates reports that include charts and tables that the user can customize to show summary or detail information about each topic. 1MB min. memory. Single user \$149; 10-pack \$795. Teknosys, 813/620-3494.

InterPlot

Application that enables scientists, engineers, and other technical users to plot two-dimensional data and perform traditional and graphical data analysis. Includes a palette of tools for on-screen integration, differentiation, statistical operations, and other mathematical operations. Provides scrollable plot windows that are one printed page in size, multiplot page layout, and object-oriented drawing tools. Automatically propagates x and y error values. User can select fill patterns and colors for point and line styles; data labels can contain mixed fonts, superscripts, and subscripts. 1MB min. memory. \$99.95 plus \$5 s/h. Scientific Visions, 301/593-0317.

Jazz through MIDI

Self-teaching jazz-improvisation course. Collection of 60 jazz sequences that includes popular jazz standards with rhythm accompaniments and solos. User selects music and loads it into sequencer, then follows the music on a keyboard, using chord chart provided with program. 512K min. memory. \$45.95. New Sound Music, 313/355-3643.

MasterKey

Utility designed for recovering forgotten or un-

known passwords in Microsoft Excel, Wingz, and WordPerfect. Generates password-recovery reports for Mac and MS-DOS files, has online help screens, and provides technical-support line. Program can be used only with access code supplied with manual, 1MB min. memory. Version for use with Wingz \$135; versions for use with WordPerfect and Microsoft Excel \$165 each. New Visions, 405/523-1639.

Microsoft Schedule+

Time-management program built on the architecture of Microsoft Mail for AppleTalk Networks 3.0. System is integrated with Microsoft Mail to enable workgroups to share individual calendars. Users can view appointments and book meetings from directly within Microsoft Mail and can access network and personal user lists maintained on Microsoft Mail. Includes privacy protection. 1MB min. memory. 5 nodes \$195; 20 nodes \$775. Microsoft Corporation, 206/882-8080.

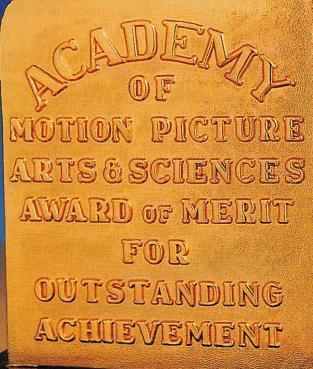
Pax Imperia

Simulation game in which users build space empire. Can be played by an individual, by multiple players on single computer, or by up to 16 players over network. User selects a galaxy in which to build an empire. Players choose planets on which to create simulated societies, with military- and *(continues)*



Pax Imperia

And the Winner is...





MacGlare/GuardPlus

In 1968, OCLI was honored by the Academy of Motion Picture Arts and Sciences with a Class II Scientific or Technical Award "for the development of an improved antireflection coating for photographic and projection lens systems." This is the same coating OCLI uses on *Mac*Glare/Guard*Plus*™ filters.

MacGlare/GuardPlus™ filters are the ultimate relief from eyestrain, fatigue and headaches caused by glare from your Macintosh monitor. OCLI's patented anti-glare coating eliminates up to 99% of the glare, stops annoying flicker, enhances contrast, and improves viewability of images on your Macintosh display.

Optical Coating Laboratory Inc. Glare/Guard Products Group 2789 Northpoint Parkway Santa Rosa, California 95407-7397 800/545-OCLI (6254) FAX 707/525-7595

© 1991 Optical Coating Laboratory, Inc. (OCLI). All rights reserved.

Glare/Guard* is a registered trademark and MacGlare/GuardPlus* is a trademark of OCLI.

The MacGlare/GuardPlus™ filter fits your Macintosh monitor so perfectly you won't even know it's there. But your eyes will feel the difference right away.

So, for the award-winning technology that's used in the movies and on your monitor, get a *MacGlare/GuardPlus™* filter.

For more information, call toll-free 1-800/545-OCLI (6254).

MacGlare/GuardPlus™ The Best You'll Ever See!

Mac Glare/GuardPlus™ filters fit Mac, Mac Classic, Mac Plus, Mac SE, Mac SE/30, Mac II Color, Mac II Mono, Apple Two-Page Mono, Apple Color RGB, SuperMac, and Mac 512K models.

Priced from \$89.95.

political-action options. Empires have a set number of resources, and players must determine how best to use those resources politically and militarily to thrive. 1MB min. memory. \$59.95. Changeling Software, 203/623-1963.

Quick Art Herbs

Collection of more than 150 clip art images of baskets, flowers, herbs, and berries. All drawings can also be modified in a paint program. 1MB min. memory. \$34.95. Wheeler Arts, 217/359-6816.

Radar

Protocol-independent network-management software that gathers information about CPUs and printers on a network. Software can control printers; search a network for specific items, based on various user-selectable criteria; and generate customized reports based on the information gathered. Network data displayed in graphic format. 1MB min. memory. 50 users \$399; 51-199 users \$499; 200 or more users \$599. Sonic Systems, 408/725-1400.

ReadingMaze

Reading software for children from preschool through second grade. Incorporates more than 300 early words. Increasingly challenging mazes invite kids to learn and practice basic reading skills. Player moves through rooms of illustrated house to search for objects that



ReadingMaze

may help to solve picture, letter, word, and sentence problems. 1MB min. memory. Black-and-white version \$49.95; color version \$69.95. Great Wave Software, 408/438-1990.

Read My Lips

Multimedia utility that allows users of existing word processing, desktop publishing, and presentation software to annotate documents with voice and sound. Utility accepts prerecorded sounds in either snd or AIFF formats, or user can record voices or other sounds with a microphone and application's record function. User can record to and play back from disk. Supports any sound device that is compatible with System 6.0.7 or later, 1MB min. memory. \$119. Praxitel, 313/485-6278.

Resolve

Spreadsheet for producing financial models, analyzing numerical data with charts and graphs, and publishing reports with charts and graphs to other documents. Supports 32-bit color for importing photographic images, supports a variety of color printers, and enables users to annotate worksheets with sounds. 1MB min. memory. \$399. Claris Corporation, 408/987-7000.

Stack Enhancers

Software that integrates preprogrammed tools into HyperCard stacks, complete with all necessary buttons, fields, scripts, and icons. Enables user to create interactive HyperCard stacks without scripting. Provides tools for creating bookmark system, card index, travel guide, progress gauge, animated text, and

others. 1MB min. memory. \$69. Cheshire Grin Productions, 416/896-8077.

SuperDisk

INIT for data compression that automatically compresses any file or folder the user designates with a .s extension or dragged into a .s superfolder. Does not change Finder information on compressed files; compressed files retain original type, icon, creator, and forks. Also creates autoexpanding files that can be opened on any Mac system, whether or not it is running SuperDisk. \$89. Alysis Software Corporation, 415/566-2263.

SuperDuper

Automated disk-copy utility that can verify that copy is identical to original disk. Program writes unique serial number on each copy disk. User is free to make selections from the menu bar or to switch applications under MultiFinder while utility is in use. 1MB min. memory. Standard version \$79; autoloader version \$150. NeoConcepts, 408/899-4821.

Sychem1: Metabolism Overview

Interactive learning software for students of biochemistry. Can be used as complement to biochemistry courses from high school through university level. Program is divided into six modules: energy production, energy consumption, control and reg-



Sychem1: Metabolism Overview

ulation, textbook, test questions, and final exam. Modules contain multimedia interactive animations of biochemical processes. 2MB min. memory. \$39.99. Irvine Interactive, 619/431-8860.

Temath

Set of numeric and graphic tools for exploring mathematical concepts and problems. Includes reflection, root-finder, curve-intersection, tangent-line, and arclength tools. Also includes a matrix calculator that performs matrix arithmetic and solves systems of linear equations, and an expression calculator. 1MB min. memory. \$39.95. Brooks/Cole Publishing Company, 408/373-0728.

Tristan

Pinball game whose background is a picture of Tristan, the knight from the Arthurian legends. Uses representation of paddles and mazes as in real pinball games. User operates paddles using various keys on the keyboard. 1MB min. memory. \$69.95. Amtex, 613/967-7900.

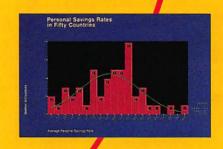
What Time Is It?

HyperCard 2.0-based program that helps children learn to tell time. Children place clock's hour and minute hands to correspond to digital clock display, or enter numbers in digital clock display to correspond to analog clock. Minutes before and after the hour can be entered. Includes context-sensitive hints at every step. Computer speaks the time with digitized sound. Five levels of difficulty. For ages 4 through 10. 1MB min. memory, \$14.95. Arch Cape Software, 301/680-8004. (continues)

Bend Us. Shape Us. Any Way You Want To.

As long as you love us, it's all right, And love us you will. Statistical software from SPSS is designed to work the way you work. By giving you the power to enter, edit, manage, analyze and present data on virtually every type of PC, workstation, minicomputer and mainframe. By giving you better decision-making ability through the most comprehensive set of statistical procedures available. And by giving you a choice of options to meet your specific data analysis needs. So if you're thinking about statistical software, think about flexibility. Because flexibility means value. And when it comes to value, we top the charts.

The Accessibility of SPSS makes it ideal for beginners and advanced users alike. With its straightforward menus and context-sensitive help and statistical glossary, SPSS gets you started fast. And with the help of our time-saving programming facilities, including macros and a matrix language, you'll have the power to go deeper even faster. And regardless of your experience with statistics, you'll be supported by the documentation and training that's set the industry standard for over 25 years. Documentation that INFOWORLD calls "The Best in the Business."

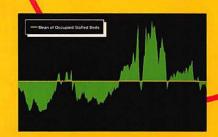




The Statistical Procedures in SPSS give you the power to examine data more thoroughly, revealing patterns that might otherwise go unnoticed. We offer the most in-depth group of statistical procedures available including univariate and multivariate descriptives, model building, hypothesis testing, clustering and classification, survival analysis, time series and perceptual mapping. No matter what your question, SPSS provides the flexibility to find the answer.

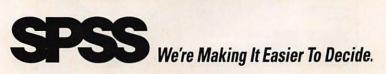
The Data and File Management capabilities of SPSS give you unparalleled flexibility when preparing data for analysis. With SPSS, information can be quickly reorganized, cleaned and transformed, regardless of size or structure. Multiple missing values for nonresponses can be defined and labeled according to your specifications, while built-in controls easily manage information stored in complex file formats, including custom file formats. Self-documenting portable files give you the freedom to move your analysis from one computing environment to the next, saving time and resources. And because SPSS supports most popular microcomputer file types including Lotus, DBF and SYLK, and offers free interfaces to such leading SQL-based database management systems as Informix,™ ORACLE® and Sybase,™ there's no need to re-enter data or write out intermediate files.

The Choice of Options offered by SPSS provide the flexibility to meet both your immediate and future data analysis needs. Unlike other statistical packages, we give you more than just the ability to choose between the options you may or may not need. We give you a choice of options designed to work together. Options that work as a system, providing the best possible software solution. Options for data entry and editing. Or producing publication-ready tables and reports. Options to analyze the past and help predict the future. Or to present your results with over 40 high-impact color displays including a variety of charts and maps. No matter what you do, SPSS can help you do it better.



So if you're in the market for statistical software, keep an open mind. Go with the value of SPSS, suppliers of statistical solutions to over 2 million users worldwide. Because when you have the advantage of flexibility, the chances are you'll still be a hit tomorrow.

Call 1(800) 45-STATS or FAX (312) 329-3668.





ACCESSORIES

Mac-Mate Accessory Base

Swivel-base stand that raises computer to eye level and enables user to rotate computer 360 degrees. Raises computer 45% inches to eye level. Includes a removable drawer that holds up to 22 disks. Comes assembled. \$99.95 plus \$6 s/h. Ark International, 800/232-6221, 708/960-7463.

BOOKS

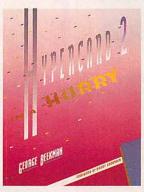
Drawing on the Macintosh

Book written for users who want to improve their graphics through the principles of presentation, form, scaling, proportion, depth, volume, and color. Teaches effective use of freehand, trace, and beziercurve tools, and includes sample projects that user

follows to create a graphic icon, cartoon, silhouette, and company logo. Book focuses on general computer drawing techniques rather than drawing with specific programs. Written by Deke McClelland. \$24.95. BusinessOne Irwin, 708/798-6000.

HyperCard 2 in a Hurry

Book that introduces fundamentals of HyperCard 2 through series of self-study,



HyperCard 2 in a Hurry



The Little System 7 Book

hands-on sessions. First two sessions introduce HyperCard 2 as tool for information storage and retrieval, and four remaining sessions illustrate essential techniques and tips for building a variety of HyperCard stacks. Class-tested by students. Covers debugger. Written by George Beekman. \$20.25. Wadsworth Publishing, 415/595-2350, 800/876-2350.

The Little System 7 Book

Brief but detailed guide to System 7. Covers virtual memory, desk accessories, new Finder and control panels, and TrueType fonts; gives advice on multitasking, customizing the desktop, creating aliases, file sharing, and networking. Includes one chapter on tips and one on troubleshooting. Written by Kay Nelson. \$24.95. Peachpit Press, 415/527-8555, 800/283-9444.

To have your product considered for inclusion in *New Products*, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number (and two copies of software) to New Products Editor, *Macworld*, 501 Second St., San Francisco, CA 94107. *Macworld* reserves the right to edit all product announcements.

High Yield CDs.



Quantum Leap delivers great value in CD software.

Quantum Leap Technologies created the largest collection of Mac software ever produced— the CD7* Super-Library with over 700 megs of select shareware and public domain programs.

Quantum Leap didn't stop there. We published an even larger disc, the **Giga-ROM**," a hefty 1,200 megabytes of shareware on a single compact disc. How did we do it? We archived and indexed the whole collection with On Location™ for fast, easy retrieval. The Giga-ROM™ offers an instant 1.2 gigabyte ready-to-go BBS file section!

We also gave you the world's largest collection of educational, instructional and self-help software, Macademic."

Watch for Quantum Leap to set the standards for price and performance in Macintosh CD Software.

CD7™ Super-Library

Archival Library

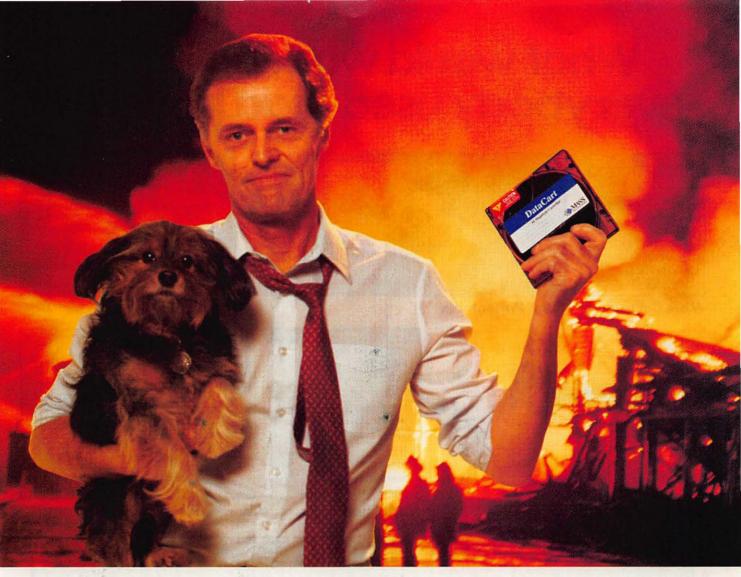
Macademic™ Education Library

Quantum Leap

Setting New Standards In CD-ROM Software
Call toll free: 800-762-2877 or fax: (305) 885-9986

Circle 82 on reader service card.





"My DataPak Saved the Day."

Have you ever had one of those days when it seems like you're spending all of your time putting out fires?

At MASS Microsystems[™], we understand how a low cost storage solution for your ever expanding business needs can really make a difference.

As the undisputed leader in removable cartridge drives, we've made it our business to make certain that your business is never in jeopardy.

With the DataPak™ you get infinite storage capacity with the performance of a fixed drive, all with reliability, efficiency and economy – regardless of your storage requirements. Each removable DataCart™ cartridge translates into 45MB (and now in 88MB) of

accessible storage – which can be taken anywhere at a moment's notice.

It's not surprising that the DataPak has won the acclaim of the entire industry; including distinguished

awards from MacUser (1989), MacUser Europe (1988), and MacWorld (1989, 1990). It's the one dependable, high

performance removable cartridge drive that can handle even the most challenging storage requirements, whatever your business or profession. From small business to the exciting world of desktop publishing, the DataPak can handle it all!

To get the complete story on how DataPak can play an important storage role in your business, call today to get the name of a dealer near you. And now you can get more storage bang for your buck! DiskDoubler[™], the data compression utility by Salient[™], is now shipping with every DataPak.

Now Available! DataPak 88 - Double Capacity 88MB Drives



810 W. Maude Avenue Sunnyvale, CA 94086 408/522-1200 800/522-7979 408/733-5499 FAX



All "registermarks and "trademarks are of their respective manufacturers. This ad developed using QuickImage" 24 from MASS Microsystems". ©1991 MASS Microsystems, Inc. All rights reserved.

Circle 207 on reader service card

What would work be like if everybody used MacDraw Pro?



MacWrite II FileMaker Pro

MacDraw Pro

MacDraw II HyperCard MacProject II Claris CAD **SmartForm Series** MacPaint



More Compatible More Presentable

More Productive



More Graphic

√ All available
MacDraw Pro
Library
Text
PICT
MacDraw
MacDraw II
EPSF
TIFF
MacPaint 2.0
MacWrite II
Microsoft Word 4.0

More Sharing



More Colorful

New Product **≡**

More Rewarding



Could your job use some exciting changes?

Well, here's our best idea yet: the new MacDraw® Pro.

We've taken the graphics tool you know and love - MacDraw II

- and stuffed it with power and new features. More than 100 new features in all.

It's the ideal, all-around graphics software for presenting, publishing, designing and illustrating! Allow us to illustrate.

Curves. A hassle with most drawing programs; no big deal with MacDraw Pro. Just use your mouse to click out the general shape you want, and presto. If you need more precision, you can use standard Bézier handles to fine-tune what you've drawn.

Colors. With MacDraw Pro you create your own custom palettes, and keep as many open as you wish. You can even name each color, so your "logo blue" is never confused with your "sky blue."

Text. It's the Achilles' heel of most graphics software - but not this one. You'll work with the same powerful formatting tools that our MacWrite® II software is famous for.

The result: instead of inventing unheard of tools that do new things, we let you use familiar tools to do unheard of things. In other words, simply powerful software.

But why read about it? Just visit your nearest Claris dealer.

And draw your own conclusions.

Upgrade for \$99. Call 1-800-628-2100, ext. 95



Simply powerful software.™

©1991 Claris Corporation. All rights reserved. In Canada, call 1-800-668-8948, ext. 48. Claris, FileMaker, MacDraw, MacPaint, MacProject, MacWrite and SmartForm are registered trademarks of Claris Corporation. "Simply powerful software" is a trademark of Claris Corporation. HyperCard is a registered trademark of Apple Computer, Inc., licensed to Claris Corporation. Microsoft is a registered trademark of Microsoft Corporation. PANTONE® is a registered trademark of Pantone, Inc. Upgrade offer good in U.S.A. only and expires 3/31/92. For more information, call 1-800-729-2292, ext. 30

Quick Tips

Making tools for SIMM removal, organizing Word 4 table commands, creating quick crop marks, and more

BY LON POOLE

ome people still think price and an extra hole are the only differences between a 1.4MB high-density floppy disk and an 800K disk. They send tips about drilling or cutting out an extra hole in an 800K disk and reinitializing to boost its capacity.

This is false economy. Although the disks may look alike if you pull open the metal shutter, the coating that magnetically stores the programs and documents is not the same. A 1.4MB disk's coating must resist demagnetization more strongly than an 800K disk's coating because initializing at the higher capacity packs the magnetic bits in the coating closer together. When you initialize an 800K disk at 1.4MB, its magnetic bits may eventually demagnetize one another. Moreover, drilling or cutting a hole may cause particles of plastic to fall inside the disk housing, where they can scratch the disk surface. In addition, pushing an 800K disk to higher capacity makes it more susceptible to external magnetic fields (such as a magnetic paperclip dispenser with a paper clip sticking out the top). Don't risk your hard work to save a few bucks-initialize disks at their rated capacity.

Keeping Columns in Line

I use Microsoft Word 4 on a Mac IIci and am annoyed that tables and business forms frequently do not line up when printed. Words and numbers that appear nicely formatted on the screen wander to the left and right as much as three or four character positions. How can that be avoided?

Norman C. Peterson Santa Monica, California A Sounds like you're lining up columns in tables and arranging items in forms by pressing the space bar. Use the tab key instead, and set the position of tab markers in each paragraph's formatting ruler. For more information, look up Tabs, Show Ruler, Paragraphs, and Tables in the manual.

The software that controls the printer, called the printer driver, observes tab settings precisely, but it may adjust the blank spaces between words. The printer driver usually adjusts word spacing on fully justified lines and in documents printed on a LaserWriter or another PostScript printer when the Page Setup command's Font Substitution option is turned on. It may also adjust spacing to account for the difference between screen (72 dots per inch) and printer resolution (300 dpi on a LaserWriter).

Centesimals Too

At the Puerto Rican Cycling Federation we use Excel 2.2 and Works to compute the riders' results. The programs can handle hours, minutes, and seconds, but for certain events we need centesimals too.

Manuel Domenech San Juan, Puerto Rico

A You can keep time to the nearest hundredth of a second in Excel 2.2 or 3.0 (but not Works) by keeping your times in four separate col-



umns—one for hours, one for minutes, one for seconds with centesimals, and one that combines the other three columns. The following formula combines hours from cell B2, minutes from cell C2, and seconds with centesimals from cell D2.

=TEXT(TIME(B2,C2,D2),"h:mm:ss")& TEXT(D2-TRUNC(D2),".00")

To add up a set of times, use three SUM functions to total hours, minutes, and seconds separately. Then use a formula like the one above to combine the totals. To average a set of times use a formula like this:

=TEXT(TIME(0,0,(B10*3600+C10* 60+D10)/R0WS(B2:D9)), "h:mm:ss")&TEXT((D10-TRUNC (D10))/R0WS(B2:D9),".00")

Here cell B10 contains the total hours, C10 the total minutes, and D10 the total seconds for the times to be averaged. The ROWS formula computes the number of times to be averaged, assuming one time per row. (continues)

HOW TO

JClock Removal

Last spring I installed a helpful INIT called JClock that displays the current time in the menu bar. Now I want to remove the clock because it obscures the icons that appear when I use MultiFinder. I tried dragging the INIT out of my System Folder and even reinstalling my system software. I can't guess what the trouble is, but I hope you can!

Byron E. Crews Minneapolis, Minnesota

A JClock installs itself in the System file, so you must throw away your System file before reinstalling the system software. Otherwise the Installer dutifully copies JClock to the new System file. After reinstalling the system software, you must also reinstall all fonts and desk accessories you have added to the System file.

Instead of reinstalling a new System file, you can remove JClock from the existing one with Apple's ResEdit utility. Make a backup copy of the System file. Using ResEdit, open the System file you want to fix, open the INIT resources, select the JClock INIT (it probably is ID=4), choose Clear from the Edit menu, and quit ResEdit, saving changes when asked.

SIMM Brackets

TIP: Recently I installed a new pair of SIMMs to increase my Mac's memory. Removing the case to get at the SIMM sockets was easy, but spreading the retaining clips to release the old SIMMs caused lots of frustration and sore fingers. I was tempted to use a screwdriver but thought better of it. Instead I made a tool from an ordinary tongue depressor by cutting off one end at a 45-degree angle.

Al Teplow Oakland, California

Be very careful when removing old SIMMs because those retaining clips break easily. A nonmetallic letter opener or a watercolor brush handle works well. A popsicle stick cut as you describe should also work. Repairing a broken clip means replacing the entire SIMM socket (an Apple dealer will probably insist on replacing the whole logic board).—L.P.

Toner Shake-Up

TIP: If the toner in your GCC PLP

II, PLP IIs, BLP II, or BLP IIs laser printer seems to be running out prematurely on the left side of the page, you may not have to replace the toner cartridge immediately. Instead, dim the lights in the room so you don't damage the photo-sensitive drum inside the printer, and take the toner cartridge outside or to a trash can. Shake the cartridge vigorously for a couple of seconds to redistribute the toner. The next time you print it should look as if you just bought a new cartridge.

William Rogers Long Beach, California

For its laser printers, Apple suggests gently rocking the cartridge from end to end to redistribute the toner along the length of the cartridge. —L.P.

Button, Button

TIP: In FileMaker Pro, I like to make buttons for commands I use frequently, because clicking a button is faster than choosing a menu item. But I found that some commands could not be assigned to a button. For example, the New Request command, which lets you specify additional criteria when finding records, isn't on the pop-up menu of commands that can be assigned to buttons. Then I noticed that the New Record command—which has the same keyboard equivalent as New Request (#-N)can be assigned to a button. I made a button and assigned it the New Record command. It functions as a New Record button when I am browsing or as a New Request button when I am finding. So if a command you want to assign is not on FileMaker Pro's list for buttons, see if a listed command has the same keyboard equivalent.

Jeanette Foshee Boone, Iowa

Handy Table Commands

TIP: I find myself frequently using Microsoft Word 4's inconvenient Cells and Tables commands. I greatly increased my productivity by using the Commands command to put 18 table-related commands in my Work menu (see "Work Table") which I now use exclusively as a Table menu.

Don Beck Stow, Massachusetts (continues)

QUICK CROP MARKS

o quickly create accurate crop marks that are smaller than the page size in page-layout and drawing programs—such as Aldus Page-Maker, QuarkXPress, Aldus FreeHand, or Adobe Illustrator 3.0—try this tip from Scott Jones of El Cerrito, California.





1. Draw a rectangle the size of the area you want cropped. Select it and send it to the back.





2. Draw a straight line exactly along the top border (using snap-to guides if you want) that extends half an inch or so beyond the sides of the rectangle. Set the line thickness to the weight at which you want the crop marks to print. Duplicate that line and drag it to the bottom border. Do the same with the left and right borders. Select all four lines and send them to the back.





3. When you are ready to print, enlarge the rectangle to give as much space between the crop marks and the image as you desire. Then set the box's line and fill colors to white (or paper color).

TI made PostScript® printing affordable.



Now we've made it fast.

Introducing the TI microLaser Turbo™ printers: They race through sophisticated graphics software faster than other printers.

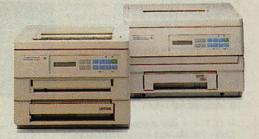
How do they do it? A RISC-based 8220 board with PostScript software from Adobe® processes information from your computer quicker. So you spend less time waiting for graphic output.

Swift and still affordable, the personal 9ppm microLaser Turbo retails for \$2,349*—a savings of more than \$2,000 on the Apple Laser Writer® Apple Postscript

II NTX. The 16ppm XL Turbo goes for \$3,749* and is ideal for an AppleTalk® network. Both feature PostScript Level 2 with 35 scalable fonts. Two of the smallest footprints you'll find. And superior paper handling that includes a 250-sheet paper drawer that slides *inside* the printer.

Dial the number below for the name of your nearest TI dealer. And take a Turbo out for a spin.

1-800-527-3500.





Circle 313 on reader service card

*Suggested retail price — dealer prices may vary. microLaser Turbo is a trademark of Texas Instruments Incorporated. Adobe, PostScript and the PostScript logo are registered trademarks of Adobe Systems, Inc. Laser Writer and AppleTalk are registered trademarks of Apple Computer, Inc.

HOW TO

I put table-related commands in my Document menu because I use my Work menu for opening frequently used documents. Many Word users are unaware that they can customize Word's menus with the Commands command, which lists many commands not on standard menus.-L.P.

The Right Style

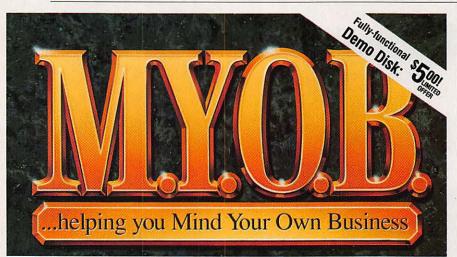
TIP: When you import a Word file into a QuarkXPress file with the Get Text command's Include Style Sheets option turned on, styles from the Word document don't replace Quark-XPress styles of the same name. As a result, the formats of paragraphs with those styles change to match the QuarkXPress style definitions. In particular, the QuarkXPress Normal style replaces Word's Normal style. This can cause major problems because

Word defaults to the Normal style, and people typically base styles they create on Normal without changing the style name.

To work around this problem, use Word's Define Styles command to rename the Normal style to Normal,n (see "Style Renaming"). Then import the Word document into QuarkXPress as usual. The Normal,n style remains intact because its name doesn't exactly match the QuarkXPress Normal style.

Within QuarkXPress, you can easily make the style sheet definitions from the Word document apply to the QuarkXPress Normal style and to styles based on it. In the Style Sheets dialog box, select the Normal style from the scrollable list of style names and click the Edit button to get the Edit Styles dialog box for the Normal style. Then use the pop-up menu to set the Based On option to Normal,n.

Ward Barnett Minnetonka, Minnesota (continues)



World Class... **Accounting Software!**



CALL TODAY!

Since its release in 1989 M.Y.O.B. has won critical acclaim throughout the industry. It is a powerful, easy-to-use, seamlessly integrated and fully-functional accounting program. Graphically interfaced, M.Y.O.B. offers a new approach to small business accounting. With a few clicks, you can control every facet of your business ...print your financial reports, reconcile your checkbook, update receivables, reorder inventory, print mailing labels, even call your customers - all with M.Y.O.B.

M.Y.O.B. Features ... General Ledger — Flexible chart of accounts • Analyze profit & loss • Analyze balance sheet . Recurring entries . Budgeting

Checkbook — Print checks • Reconcile accounts • Cash Flow • Recurring checks/deposits Accounts Receivable - Item/Service invoices • Statements • Receivables/Sales analysis

Accounts Payable - Purchase order control . Auto-calculate taxes . Auto discounts . Easy posting Multiple payments
 Auto purchase journal

Inventory — Retail items • Service items • Manufacturing items • Auto pricing • Inventory analysis Auto adjustments

Card File — Track customers • Vendors Prospects • Employees • Contact log • Mailing labels . Personalized letters

Administration — Business calendar • Receivable alerts • Payable alerts • Order shipment reminders • Auto inventory reorder . Re-contact reminders

Try M.Y.O.B. free for 30 days if you're not completely satisfied send it back for an unconditional refund.

...M.Y.O.B. is a solid double-entry Accounting System that can work in any small business. MacUser, April '91





System 7 Savvy

1-800-322-MYOB Send me a fully-functional Demo Disk for only \$5.00! Name Address City State Zip Daytime Phone (Preferred payment method (check one) ☐ Check or money orer enclosed ☐ Visa ☐ MasterCard Card No. Exp. Date Mail to: TELEWARE 300 Roundhill Dr. Rockaway, NJ 07866 (201) 586-2200

Circle 76 on reader service card.

Work

Insert Table... Table to Text...

Show Table Gridlines Table... Cells...

Merge Cells Split Cell

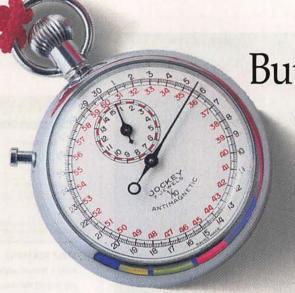
Insert Columns Insert Rows Insert Cells Right Insert Cells Down Insert 9 Above Row #%_

Delete Columns Delete Rows Delete Cells, Shift Left Delete Cells, Shift Up

Cell Borders... TLBR Single Cell Border TLBRM Single Cell Border

WORK TABLE You can turn Word 4's Work menu into a Table menu by using the Commands command to add table-related commands to it.

PostScript® language solutions for LaserJet® printers haven't exactly set records for speed.



But times have changed.

In the past, patience has been a necessity for getting PostScript language quality graphics and text on a LaserJet IIP, III,

IIID, or IIIP laser printer.

Introducing PacificPage
XL™ for Macintosh – it will
change the way you look at
PostScript language emulation
products, both in
performance and price.

PacificPage XL for Macintosh provides the newest version of the PacificPage P • E cartridge, our PacificTalk interface module, and a high speed accelerator board that installs into the printer's memory slot. Included on the accelerator board is an Intel i960™ KB RISC microprocessor and 2 MB of memory which produces output 2 to 8 times faster and at a lower price than competitive cartridge solutions.

PacificPage XL for Macintosh supports Adobe® Type 1 and 3 outline fonts and utilizes the Resolution Enhancement feature of the LaserJet III printer family for the sharpest 300 dpi output available. And, PacificPage XL for Macintosh comes

with a lifetime warranty and a money back guarantee of satisfaction.

If you're looking for

a change of pace in
PostScript language
solutions for the HP
LaserJet printer, call
your nearest dealer or
contact Pacific Data
Products Inc., 9125 Rehco
Road, San Diego,
California
92121, U.S.A., (619)
597-4651, Fax (619)



PACIFIC DATA PRODUCTS



Time comparisons shown above reflect downloading of files to start of printer engine. PostScript cartridge products were used with the HP LaserJet III, and all times were measured on the Macintosh IIci over AppleTalk. PacificPage XL, PacificPage P • E and PacificTalk are trademarks of Pacific Data Products, Inc. Macintosh and AppleTalk are registered trademarks of Apple Computer, Inc. 1960 is a trademark of Intel Corporation. Phoenix Technologies Ltd. HP, LaserJet and Resolution Enhancement are registered trademarks of Hevlett-Packard Co. PostScript and Adobe are registered trademarks of Adobe Systems Incorporated. EUROPEAN HEADQUARTERS: Switzerland Tel (41) 22-412650, Fax (41) 22-410682. © 1991 Pacific Data Products, Inc.

552-0889.

HOW TO

Start-Up Stuff in System 7

TIP: With System 7, system extensions (formerly called INITs or startup documents) go in the Extensions folder, and control panels (formerly called Control Panel devices or cdevs) go in the Control Panels folder. Both special folders are inside the System Folder. But some older extensions and control panels don't work inside the special folders. I work around this by putting aliases of such items in the System Folder itself.

Russ Nelson Portland, Oregon

I do just the opposite: I put the recalcitrant extensions and control panels directly in the System Folder. System 7 automatically installs extensions and control panels located directly in the System Folder as well as those in the special Extensions and Control Panels folders. As a result, I don't need to put aliases of those extensions in the Extensions folder. I do make aliases of all control panels residing directly in the System Folder and put those aliases into the Control Panels folder. The aliases let me access the control panels in the System Folder by opening the Control Panels folder (from the Apple menu).

Whereas older system software installs system extensions and control panels only in alphabetical order, System 7 installs them in three groups, alphabetically within each group. It starts with the Extensions folder, goes next to the Control Panels folder, and finally installs extensions



STYLE RENAMING To make sure a Word document's Normal style won't be redefined when you import the document into QuarkXPress, use Word's Define Styles command to change the name to Normal,n.

and control panels it finds in the System Folder itself. This change in the installation sequence can cause problems for older system extensions and control panels.—L.P.

We pay from \$25 to \$100 for tips published here. Send tips or questions (include your address and phone number) to Quick Tips, Macworld, 501 Second St., San Francisco, CA 94107. Send electronic mail to CompuServe (70370,702) or MCI Mail (294-8078). All published submissions become the property of Macworld. Due to the high volume of mail received, we're unable to provide personal responses.

Lon Poole answers readers' questions and selects their tips for this monthly column. His two most recent books are Amazing Mac Facts (Microsoft Press, 1991), a collection of the best published tips; and Macworld Guide to System 7, IDG Books, 1991).

So You're Feeling Squeezed



Ouch. Another typical day at the office—rush projects, training seminars, capital crunches and trade shows—just for starters. No need to panic. Now there's help.

Rent a PC or a workstation from Genstar—Apple, IBM, Compaq, Toshiba or Sun Microsystems. Get the equipment overnight and keep it as long as you want. Imagine using state-of-the-art equipment with no obsolescence worries. Plus, you can expense, rather than capitalize, to take the pinch off your balance sheet.

One call and we're on your team. Together, we'll find the best way to take the squeeze off. Call toll free today.

RENTAL ELECTRONICS, INC.

1-800-422-3300 (US)

1-800-387-6646 (Canada)

Pocket Power





The world's fastest 3.5 inch, Erasable Optical Drive.

The world's first 3.5 inch, Erasable Optical Drive.

Pinnacle Micro, the leader in 5.25 inch optical storage systems, now brings you the first 3.5 inch erasable optical drive.

The new REO-130™ with its small size and quick 30 msec. speed is what the world's been waiting for in optical storage.

Each 3.5 inch disk holds 128 megabytes of valuable data, safe and secure.

You can hold the disk in the palm of your hand. You can put it in your pocket, or drop it in the mail.

If you need to distribute or archive large amounts of data, the REO-130™ is the perfect choice.

The drive system is available in both internal or external versions. Interface kits available for MAC, SUN, DEC, IBM and compatibles.

Pocket sized. Amazingly fast. Large capacity, is optical storage now.

Another first from Pinnacle Micro, the Optical Storage leader.

Call today for the name of your nearest authorized dealer.

© (800) 553-7070



Hard Drive TuneUP Includes System 7!

Software Architects Everything—and we mean everything—you need to switch to System 7. Includes *The Sys*tem 7 Book by Craig Danuloff and exclusive Hard Disk TuneUp software that lets you prepare your hard disks for System 7 safely and easily. Allows you to upgrade your drive to take advantage of new System 7 features, including: Virtual Memory. Create multiple partitions on the same drive-one for 7.0 compatible files and one for non-compatible files. Makes your drive run faster and safer too! Supports Apple and most third party hard drives. Plus you get a set of System 7 installation disks free! Limited time offer-order today.

SuperDisk!

More System 7 stuff than you

SuperDisk!

lus Gallery Effects

Alysis Software OOEffectively enlarges your hard disk through ultrahigh-speed compression. Compresses and decompresses applications and data files automatically. Highest throughput and greatest compatibility of any compression option for the Mac. Works with cdevs, INITS, DAs, as well as applications. System 7 savvy. Disk Doubler users \$20 rebate!

Intouch

Advanced Software OOAn easy-to-use DA that stores unlimited names, addresses, phone numbers and notes, prints envelopes and labels, dials telephone numbers and more. Called "the best name-and-address DA for the Mac," and awarded 4-1/2 mice by MacUser (4/91) Network 3-pack now available \$112.

Gallery Effects

Aldus Automatically transforms grayscale and color bitmap images into stunning and sophisticated art. Application, DA and plug-ins for programs like Photoshop included. Sixteen master effects, including Charcoal, Chrome, Graphic Pen, and Watercolor. Thousands of variations from each effect.

Infini-D

Specular 70 Integrated 3D modeling, rendering, and animation with an interface so easy you'll create stunning photo-realistic graphics within hours. Includes 250 surface libraries, full tutorial, animation viewer. Free 1.1 upgrade supports System 7, 3D TrueType fonts.

Classic Performer

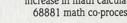
Harris Labs @OReasonably priced 16Mhz accelerator w/64k fast static RAM cache circuit doubles the speed of a standard Classic. Provides 96% improvement in processor speed, 15% boost in SCSI speed, and 75% speed increase in math calculations. Ask about the 16Mhz 68881 math co-processor. Limited lifetime warranty.

Silhouette Trackball

Everex Systems The radical—but comfortable mouse alternative that lessens fatigue and enhances performance. Features a specially contoured chassis, four differently weighted/colored balls, programmability, lock button with LED, cdev software, and a twoyear warranty. System 7 compatible.

Inspiration

Ceres 70 Innovative visual thought processor for brainstorming, organizing, and communicating ideas as diagrams, mindmaps, presentation visuals, outlines, re ports, and proposals. Integrates diagramming and outlining to help you see and communicate your ideas as visuals and text.



Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090

7 System 7 Compatible 7 System 7 Savvy Money Back Guarantee

MACNIFICENT SAVINGS!

Get MACWORLD for just

per issue!

Please enter a subscription to MACWORLD in my name for the term indicated below:

subscription price (for Canadian GST). Add \$70 annually for all other foreign countries.

BEST Dea! 3 years (36 issues) - \$54.00 (\$1.50 per issue	Name
\$54.00 (\$1.50 per issue	Company
GREAT Deal! 2 years (24 issues) - \$39.97 (\$1.67 per issue	Address
\$39.97 (\$1.67 per issue	City/State/Zip
	☐ Please bill me. ☐ Payment enclosed. 4BCY2
600D Deal! 1 year (12 issues)-	Allow 4 to 6 weeks for delivery. Basic subscription price is \$30 for 12 issues. The annual cover price is \$3.95 per issue, \$47.40 annually. For Mexican subscriptions, please add \$18 per year for shipping. For Canadian subscriptions, add \$18 per year plus 7% of

\$24.00 (\$2.00 per issue)

Subscribe <u>now</u> and SAVE \$\$\$!



NO POSTAGE NECESSARY IF MAILED IN UNITED STATES

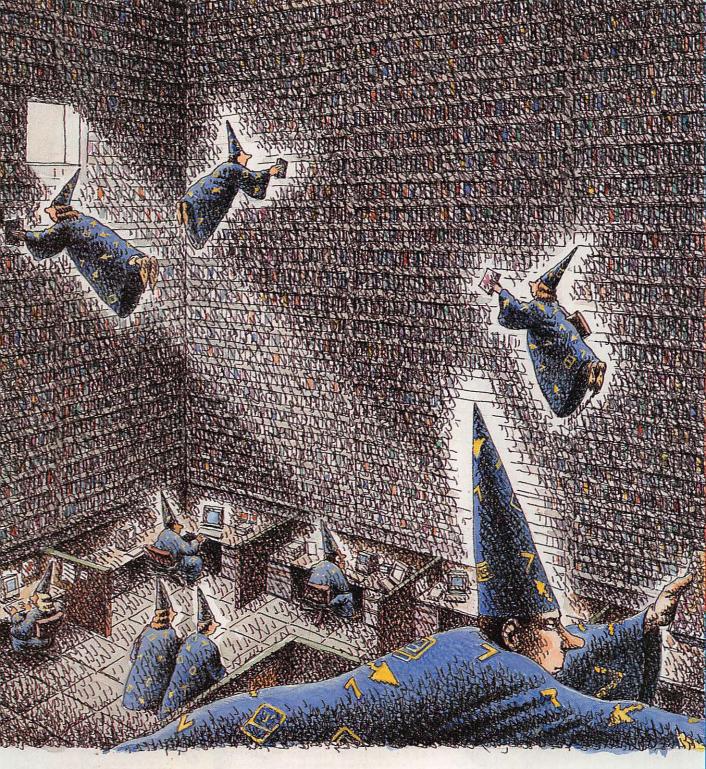
BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1167 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld Subscription Department P.O. Box 51666 Boulder, Colorado 80321-1666





Wizards are working at Mac's Place.

How else can you explain the wise answers you get to your questions? The software information the Mac's Place people always have at their fingertips? The calm, reassuring voices on the other end of the phone? It's really no surprise some people feel that way. But the real reason is that we're the only major mail order company that's *Mac compatible**. That means we know more about Mac products—including System 7 compatible products—than anyone else. So we can answer your questions better than anyone else and make sure you get the products that are right for you. Try us. It's isn't wizardry that sets us apart. It's knowledge.



Our Hours: Monday through Friday 6AM-10PM PST and Saturday 6AM-6PM PST Call 1-800-367-4222 US & Canada

Macintosh Compatible means we run our company completely on Macs. Everyone has at least one MacIlcx on their desk, equipped with 8 megs RAM, 40MEG Hard Drive,14 color monitor, connected via our Ethernet network to our custom-programmed database. The database literally runs all phases of our operation — product information, order taking, order processing, inventory control, accounting, purchasing, customer service, technical support. Allo ful or also have complete desktop communications, connecting to online services and other corporates eites around the world via memail, networked modems and FAX modems. So you see, we don't just sell 600MEG hard drives, high speed networked modems, and system 7 applications-they're all an integal part of our day to day operation.

"Fax us your PO*-My Fax-206-881-3090."-Mac



Wolfram Research OoStandard \$519 and Enhanced \$789. System for doing numerical, symbolic and graphical computation used both as an interactive calculation and a programmable language. Numerical capabilities include arbitrary precision arithmetic and matrix manipulation. Generates graphics in PostScript

Panorama II

ProVUE OONew version of the 1989 MacUser Eddy and 4-1/2 mice winner that lets you manage business information faster and easier. Easy enough to build your first database in minutes, but powerful enough to run your business for years. System 7 compatible.





Motion Works 7 The first animation and color paint program to be fully integrated within HyperCard 2.0-add animation, color and sound to any stack! Features intuitive interface, pathbased animation, built-in color paint with 24-bit color support, and much more.

Mac To Mac

Caravelle Network 5 pak \$158, 10 pak \$224. Fast, simple background file transfers over any AppleTalk Network. Sends and retrieves files. Excellent security. Activity log. Handles multiple zones. Two-way text conferencing and message facility also. Mac Plus or higher, 6.02 or higher.

DataClub 2.0

IBS OONew version. 7.0 Savvy! 5 User \$189 10 User \$498 Provides five time the performance over older vers. Offers dedicated file server convenience without the hardware expense. The easiest to use filesharing software ever! Perfect for any size network.

Brøderbund Amazing paint program created just for kids. Combines special effect art tools, picture stance, sounds and magic screen transformations to turn the computer into a magical art studio. Every brush and tool has it's own unique sound effect.

ORDER INFO

- VISA, MASTERCARD, AMERICAN EXPRESS, and OPTIMA
- Your credit card is never charged until your products ship. When a partial order is shipped, no additional freight is charged for shipments that complete the order (U.S. only).
- Most items carry the manufacturer's 30 or 60 day Money Back Guarantee (MBG), Mac'sPlace has a 30 day MBG on all hardware (USA only). Ask for details when ordering. 120 day limited warranty on all products, some hardware
- items carry one and two year warranties. Defective software is replaced immediately with like item(s). Defective hardware items repaired or replaced at our discretion. Loan drives subject to availability (USA only).
- Most personal and company checks approved upon receipt to insure immediate shipment. For non-standard checks and

- No sales tax (except WA residents add 8.2% to total, including shipping).
- · All returns must have an authorization number. Please call
- All prices & promotions subject to change without notice All items subject to availability. Not responsible for typographic errors.
- Orders USA: Orders placed weekdays by 7:30 pm E.S.T. 4:30 pm P.S.T. for "in stock" items ship same day (barring system failure, etc.) for overnight delivery via Airborne Express. Our \$3.00 shipping charge includes insurance at no extra charge. Rural locations may require an additional day for delivery. Areas not serviced by Airborne will be sent via U.S. Postal Service or UPS Second Day. Alaska & Hawaii orders ship UPS 2nd day air. Alaska customers utside metropolitan areas pay full shipping charges, ask for rates.

Purchase Orders: Government, School, and Institutional P.O.'s clear immediately. *Corporate PO's subject to

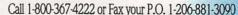
The Paint Program

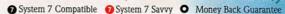
credit approval. Full shipping charges apply.
International Orders: Call 206-883-8312. We ship throughout the free world via Airborne Express International. Contact Mac'sPlace for information, Mail,

FAX or electronic orders gladly accepted.

Electronic Mail Orders: Compuserve (76635,660); GEnie (PLACE); America Online (MacsPlace). Mac'sPlace uses CE Software's QuickMail™ to check our mail each hour. Phone: 800-367-4222, 206-883-8312, FAX 206-881-3090 Mail: 8461 154th Ave NE, Redmond, WA 98052 © 1991 Mac'sPlace, Inc.

Like all aspects of Mac's Place's operation, this ad was entirely designed and assembled using Macintosh technology. No paste-up. No stripping.









can shake a mouse at." -Mac



Bernoulli Transportable 90 Meg

IOMEGA OIOMEGA, long known for their reliability, now offers a fast and affordable removable storage with a 5 year warrantee. Also see our listings for the DataPlace Hard drives starting with the DP 52 mb Quantum external at \$398.

SuperMac Software 70 New version (2.0) extends the paint category into artistic image processing. Dramatically simplifies demand design work such as image compositing, masking, and special effects such as embossing, patterning, tinting, and image warping. Too many great features to list. Pixel Paint 2.1 \$165. The first color paint product for the Mac and still the standard by which all others are judged.

Type Set for Business

variety of popular business applications, including Letters, Memos and Faxes, Overheads and Slides, Invitations and Awards, and Spreadsheets and Graphs. Each set includes 8-10 typefaces and Adobe Type Man-

Mac's Place TO Expand the mind of your Mac! One Meg SIMM, 80 nanoseconds, only \$45! Four Meg SIMM only \$195. Includes the most complete installation manual available. Get your Mac ready for System 7. See Listings for IIfx prices.

10T Hub & MacCon+ Ethernet

Asanté @OSee Listings for Prices The media flexibility you need in any office with tremendous price performance. Twelve 10BaseT ports, plus one each for thick and thin Ethernet™. Asanté offers a full line of Ethernet cards for all Macs. 5 year warrantee.

EZ Music Starter Kit \$155.

Opcode OoIncludes: EZ Vision—Multi track sequencer, tons of features; MIDI Translator- MIDI interface (1 in, 3 out); Book of MIDI-HyperCard stack for learning MIDI; and PAN Membership-Musicians' BBS full of tips and support. Requires Mac Plus and MIDI sequencer

Version Territory

Softwriters 10 User \$138.00 7•Updater™ 6 user \$68 Allows Network Managers to upgrade or install any software-including System 7-across the network from one Mac. Quickly update your users with DAs, address book lists, and more without interfering with their activities. Get 7. Updater™ if you only need to update to System 7.

More After Dark \$23

Berkeley 7 After Dark/M.A.D. Bundle \$41. Over 25 incredible new displays for After Dark, including Berkeley contest winners Mowin' Man, GraphStat, and Tunnel, plus many beautiful new fish. Includes Virex-D virus detector module from Microcom, Requires After Dark (order bundle and save!).





VersionTerritory

MIDI Translator

EZ Vision

Listings

"Seven is heaven." -Mac



Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090

System 7 Compatible System 7 Savvy Money Back Guarantee

"Our Mac Wizards know System

•	ACCESSORIES	ı
•	Acco International, Inc.	
•	DiskPage/10 Pages/120 Disks 28.	
	Advanced Gravis Mousestick 64.	
٠	O SuperMouse84. Apple	
٠	Toner/Laserwriter II	
ŀ	Voice Link	
٠	Casio Casio	
٠	O Voice Link 198. O Voice Navigator II 549. Casio	
•	CoStar Corporation	4
i	Stingray Trackball 98. Datadesk	
	OO Mac 101E (All Macs) 126.	
	Everex O Silhouette Trackball79.	
٠	Farallon MacRecorder 2.0	
•	Tollowos .	
٠	Diskette Holder Oak (Holds 45)	
•	Uak (Holds 120)	
	Imagewriter Multi Color	
	Goldstein & Blair	
	Macintosh Bible 3.019. Macintosh Bible W/Disk26.	
	Kensington Microware O 7' Long ADB Keyboard Cable . 24.	
•	Apple Security Kit System 33. MacIl Stand W/Exten Cables . 64.	
٠	SE Hadiation/Anti-Glare Filter 52.	
٠	O Tilt Swivel	
•	O Mac Pro Plus	
	Kraft	
	• KM 30 ADB 49. • Premium III ADB 49.	
	Mac's Place 7 Outlet Noise/Surge	
٠	Speed Mouse Pad	
٠	Macintosh Cables (Full Line) Call.	
•	150Meg Tape CS600XD 22.	
۰	MSC Technologies	Y,
*	OO ADB Trackball 68.	8
	Sony	V.
	Double Sided 10 Pak	
	HD-Bulk 50 Pak	
•	Targus O Mac/SE Bag Black54.	
•	Extended Keyboard Bag • Black, Navy, Gray, or Wine 68.	
•	BUSINESS	
•	NEVERBOARD SINCE	
	Aatrix OO CheckWriter II29.	
	ACIUS O 4th Dimension	
•	O File Force 245. Advanced Software	
•	7 Docucomp	
•	Caere OmniPage	
•	CE Software QuickMail 2.5	
•	Q Quickmail 2.5 Single User 138.	

		•	•	•	•	•	•
0 0	5 Use	ers				398	
00	50 Us	sers .				1714.	
Cere						100	
O O Che						. 158.	
						. 109.	
O Ca	ultiLe	dger	2.0			. 225.	
O Pa Clar						. 109.	
	Claris leMal	s Res	olve .			. Call.	
O FI	leMal	ker Pr	0			. 215.	
Ø N	lacPro lacWr	ite II				. 137.	
Com	puS	erve					
Comp	ouserv	ve Mi ve Na	embe vigati	rship or	KIT	45.	
Delt	aPo	int l	nc.				
00			h Pro	fessi	onal .	. 192.	
Fara	Diekp	onor			19	88	
00 00	mbuk	tu 4.0)			. 136.	
Fox	Timb	uktu	Remo	ite 2.	0	. 134.	
O Fo	xBAS	E+/N	lac			. 289.	
O Fo	xBAS	E+/N	lac M	lultiU	ser	. 398.	
Free O W	soft	Col	mpa	ny		95	
Grea	at Pi	ains	s So	ftw	are	00.	
Plain		imple				. 255.	
Hay OS	es marte	om II				83	
Insi	ania	Sol	utio	ns			
A SoftP	ccess	PC				62.	
AT/E Vers.	GA M	odule				. 125.	
Vers.	1.3 fo	or 020	and	030s	8. Pos	. 239. t.135.	
Inte							
Soft						1000	
O Da	ata Cli	ub 3 (ub 10	User User			. 189.	
Intu	it						
O Qu						38.	
OM						. 134.	
Mic	roso	ft					
00 0 0t	fice					525	
20	Powe	erPoir	nt			. 242.	
00	Proje	ct 1.				. Call.	
00	Work	(S				. 182.	
Mic	roso xcel 3					21	
Nol	Pre	ess	1				
O Fr	r The	Reco	rd			32.	
O W	ili Ma	iker 4				36.	
00	Doub			ers.3.	5	. 438.	4
ON OM				Han	1	200	-1
OM	eeting	Ma	ker (3	O Use	er)	. 549.	
Para	gon	Co	nce	ots			
O N Pres	cier	1Ce			444		
Expre Theo	ssion	ist 2.	07			86.	
Pro\	/UE	Dev	elor	me	nt C	. 245. Ord.	N
O Pa	noran						
Qua						400	
Real	lity 1	Tecl	inol	ogy			
00	Weal	Ith Bu	ilder	******		98.	
Refe O Gr	amma	etik N	Mac V	2	•	49.	
Sen	sible	So	ftwa	are			
Sensi Soft	ble G svnc		ar		*******	51.	

•	•	•	•	•	•	•	•
Su	viv	or S	oft	var	9		FO
Syl	man	tec					
Svi	mme	atrv					
Svi	Acta n er c	7 Jy S	oftv	vare			74.
0	O Ka	leida	grapl	12.0		1	44.
Sm.	∕lak artbu	er indle				2	214.
		riteN are	ow 2	.2		1	19.
0	O M	Y.O.F.	3			1	39.
0	O Tir	neSli	os III		atio	1	67.
0	TS A	ccour	iting	Link (TAL)		52.
Top	s 3.0	Net	work	Bund	le	1	86.
Wo	Math	am F	lese	arc	h In	C.	789
0	Math	emat	ica S	td 2.1	D		
Ø	Word	Perfe	ect V	2.0). 	2	278.
Ze	dco	r Inc	3				
						4	13.
6	D-	RC	JΙV	1			
		1 Driv		au Zean		W	rip.
		ACI			Drive	5	558.
NE		oot (ו פחי	ntorf	ace K	IT	en
0	Inters	sect (DR-3	36 Po	rtable	4	138.
Cys	an mic	Osmo					46.
The	Mar	nhole					37.
0	Berke	ery S	MUC	PD I	ROM		88.
0	Birds Naut	of Ai	meric	a riptio	n		51. 20.
0	Shak	espea	are or	n Disi	Disc		51.
Dig	jide	sig	n				
Du	bl-C	Click	c So	ftw	are		
	The V		et TM (CD		2	218.
Me	dia T	racks			CD	3	808.
		Glot ning T			rench	·	62.
0	Learr				panis		
0	Office	e CD-				5	599.
Pa	SSP(ort I	Desi Ausic	gns Crea	tivity	Kit 1	89
0	Pro N	Ausic	Prod	uctio	n Kit	12	249.
G	RA	PF	HC	S			
3G	Gra	phi	CS		-	Ħ	H
Ima	aes l	N/Im	nact				co
			s & S	Symb	 ol		49.
	obe Line		dobe	PS F	onts .	C	Call.
Тур	e On	Call is Par	k			1	47.
Col	lecto	r's Ed	lition	II		1	42.
0	Photo	oshor	2.0		M 2.0	E	49.
Stre	eamli	rt 1-4 ine 2.	0			1	17.
0	Type Type	Aligr Man	ı ager				62. 59.
0	Type	Reur	ion .				41.
Typ	e Set	t 2			••••••		64.
Тур	e Set	s for	Busii	ness		1	24.

Overheads & Slides Spreadsheets & Graphs Aldus Freehand 3.0 Pagemaker 4.0 Persuasion 2.0	95. 95.
Aldus Preehand 3.0	95.
Aldus Preehand 3.0	
♠ Freehand 3.0	
Pagemaker 4.0 Persuasion 2.0	207
Pagemaker 4.0 Persuasion 2.0	397.
Persuasion 2.0	497.
	325.
Altsys	
Po Fontographer 3.2	262
Metamorphosis	
	05.
Ares Software	
ProntMonger	62.
Baseline Publishing	
OO Color MacCheese	56
COIDI IVIACCITEESE	50.
Broderbund	
Banner Mania	36.
Print Shop 7 TypeStyler 1.5	35.
■ TypeStyler 1.5	115.
Claris	
O Claric CAD	005
Claris CAD	025.
MacDraw II	284.
Custom Applications	
Freedom of Press	255
Freedom of Press Lite	55
Delta Tea Caffarana	
Delta Tao Software Inc.	
O Monet	238.
Deneba	
@ Canvas V3.0	208
O Ultrapaint	125
	120.
Dynaware	
DynaPerspective	595.
Eastgate Systems	
Fontina	25
Flantania A.	JJ.
Electronic Arts	
90 Studio/32	438.
Studio/8 V2 0	187
FiseWare Corn	
ElseWare Corp. O DataShaper O BarCode Kit	100
Datasilaper	135,
Barcode Kit	135.
Gold Diek	
Animation Works	121.
Innovative Data Design	
■ MacDraft	
MacDraft	279.
	279.
MicroFronier O Enhance 2.0	279.
MicroFronier O Enhance 2.0	279.
MicroFronier O Enhance 2.0 Motion Works	279. 235.
MicroFronier © Enhance 2.0 Motion Works ADDmotion	279. 235. 182.
MicroFronier © Enhance 2.0 Motion Works ADDmotion	279. 235. 182.
MicroFronier O Enhance 2.0	279. 235. 182. 429.
MicroFronier O Enhance 2.0	279. 235. 182. 429.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D Professional	279. 235. 182. 429. 374. 429
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D Professional	279. 235. 182. 429. 374. 429
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D V1.2 O Swivel 3D V1.2	279. 235. 182. 429. 374. 429. 294.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D Professional O Swivel 3D V1.2 O SwivelArt	279. 235. 182. 429. 374. 429. 294.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D Professional O Swivel 3D V1.2 O SwivelArt Silicon Beach (Aldus)	279. 235. 182. 429. 374. 429. 294. 81.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D V1.2 O Swivel At V1.2 O Swivel At Notice (Aldus) O Digital Darkroom V2.0	279. 235. 182. 429. 374. 429. 294. 81.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D V1.2 O Swivel At V1.2 O Swivel At Notice (Aldus) O Digital Darkroom V2.0	279. 235. 182. 429. 374. 429. 294. 81.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D V1.2 O Swivel At V1.2 O Swivel At Notice (Aldus) O Digital Darkroom V2.0	279. 235. 182. 429. 374. 429. 294. 81.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D V1.2 O Swivel At V1.2 O Swivel At Notice (Aldus) O Digital Darkroom V2.0	279. 235. 182. 429. 374. 429. 294. 81.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D V1.2 O Swivel At V1.2 O Swivel At Notice (Aldus) O Digital Darkroom V2.0	279. 235. 182. 429. 374. 429. 294. 81.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D Professional O Swivel 3D V1.2 O Swivel Art Silicon Beach (Aldus) O Egiglat Darkroom V2.0 O Gallery Effects Classic Art O Personal Press O Super 3D 2.0 (Color) O SuperPaint 2.0	279. 235. 182. 429. 374. 429. 294. 81.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D V1.2. O Swivel 3D V1.2. O Swivel 3D V1.2. O Swivel 3D V1.2. O Gallery Effects Classic Art. O Personal Press O Super 3D 2.0 (Color) O SuperPaint 2.0. Specular International	279. 235. 182. 429. 374. 429. 294. 81. 258. 135. 195. 328. 134.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D Professional O Swivel 3D V1.2. O Swivel 3D V1.2. O Swivel Art Silicon Beach (Aldus) O ligital Darkroom V2.0 O Gallery Effects Classic Art O Personal Press O Super 3D 2.0 (Color) O SuperPaint 2.0. Specular International O Infini-D	279. 235. 182. 429. 374. 429. 294. 81.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D Professional O Swivel 3D V1.2 O Swivel 3D V1.2 O Swivel AI O Digital Darkroom V2.0 O Gallery Effects Classic Art O Personal Press O Super 3D 2.0 (Color) O Super 3D 2.0 (Color) O Infini-D SuperMac Software	279. 235. 182. 429. 374. 429. 294. 81. 258. 135. 195. 328. 134. 648.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D Professional O Swivel 3D V1.2 O Swivel 3D V1.2 O Swivel AI O Digital Darkroom V2.0 O Gallery Effects Classic Art O Personal Press O Super 3D 2.0 (Color) O Super 3D 2.0 (Color) O Infini-D SuperMac Software	279. 235. 182. 429. 374. 429. 294. 81. 258. 135. 195. 328. 134. 648.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D Professional O Swivel 3D V1.2 O Swivel 3D V1.2 O Swivel AI O Digital Darkroom V2.0 O Gallery Effects Classic Art O Personal Press O Super 3D 2.0 (Color) O Super 3D 2.0 (Color) O Infini-D SuperMac Software	279. 235. 182. 429. 374. 429. 294. 81. 258. 135. 195. 328. 134. 648.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker. O Model Shop O Swivel 3D Professional. O Swivel 3D Professional. O Swivel 3D V1.2. O Swivel Art. Silicon Beach (Aldus) O Digital Darkroom V2.0. O Gallery Effects Classic Art O Personal Press O Super 3D 2.0 (Color) O Super 3D 2.0 (Color) O Super International O Infini-D. SuperMac Software O PixelPaint 2.1 O PixelPaint Pro	279. 235. 182. 429. 374. 429. 294. 81. 258. 135. 195. 328. 134. 648.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D Professional O Swivel 3D V1.2 O Swivel 3D V1.2 O Swivel 3D V1.2 O Spice Swivel 3D V1.2 O Swivel 3D V1.2 O Suivel Art Silicon Beach (Aldus) O ligital Darkroom V2.0 O Gallery Effects Classic Art O Personal Press O Super 3D 2.0 (Color) O Super Bait 2.0 O Specular International O Infini-D SuperMac Software O PixelPaint 2.1 O PixelPaint 2.1 O PixelPaint Pro Symmetry	279. 235. 182. 429. 374. 429. 294. 81. 258. 135. 195. 328. 134. 648.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D Professional O Swivel 3D V1.2 O Swivel 3D V1.2 O Swivel 3D V1.2 O Swivel AT Digital Darkroom V2.0 O Gallery Effects Classic Art O Personal Press O Super 3D 2.0 (Color) O SuperPaint 2.0 Specular International O Infini-D SuperMac Software O PixelPaint Pro Symmetry Mariah 1.0.4	279. 235. 182. 429. 374. 429. 294. 81. 258. 135. 195. 328. 134. 648.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker O Model Shop O Swivel 3D Professional O Swivel 3D V1.2 O Swivel 3D V1.2 O Swivel 3D V1.2 O Spice Swivel 3D V1.2 O Swivel 3D V1.2 O Suivel Art Silicon Beach (Aldus) O ligital Darkroom V2.0 O Gallery Effects Classic Art O Personal Press O Super 3D 2.0 (Color) O Super Bait 2.0 O Specular International O Infini-D SuperMac Software O PixelPaint 2.1 O PixelPaint 2.1 O PixelPaint Pro Symmetry	279. 235. 182. 429. 374. 429. 294. 81. 258. 135. 195. 328. 134. 648.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker. O Model Shop O Swivel 3D Professional O Swivel 3D V1.2. O Swivel 3D V1.2. O Swivel 3D V1.2. O Spitch State Classic Art O Eaglery Effects Classic Art O Personal Press O Super 3D 2.0 (Color) O SuperPaint 2.0. Specular International O Infini-D SuperMac Software O PixelPaint 2.1. O PixelPaint Pro. Symmetry O Mariah 1.0.4. Timeworks	279. 235. 182. 429. 374. 429. 294. 81. 258. 135. 195. 328. 134. 648. 85.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker. O Model Shop O Swivel 3D Professional. O Swivel 3D V1.2 O Swivel 3D V1.2 O Swivel Art. Silicon Beach (Aldus) O Jujital Darkroom V2.0 O Gallery Effects Classic Art O Personal Press O Super 30 2.0 (Color). O SuperPaint 2.0 Specular International O Infini-D SuperMac Software O PixelPaint Pro Symmetry O Mariah 1.0.4 Timeworks O Publish It! Easy 2.1.1	279. 235. 182. 429. 374. 429. 294. 81. 258. 135. 195. 328. 134. 648. 85.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker. O Model Shop O Swivel 3D Professional. O Swivel 3D V1.2. O Swivel 3D V1.2. O Swivel 3D V1.2. O Silicon Beach (Aldus) O Jigital Darkroom V2.0. O Gallery Effects Classic Art O Personal Press. O Super 3D 2.0 (Color). O Super Paint 2.0 Specular International O Infini-D SuperMac Software O PixelPaint Pro Symmetry O Mariah 1.0.4 Timeworks O Publish It! Easy 2.1.1 Zedcor Inc.	279. 235. 182. 429. 374. 429. 294. 81. 258. 135. 328. 134. 648. 165. 465. 85.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker. O Model Shop O Swivel 3D Professional. O Swivel 3D V1.2 O Swivel 3D V1.2 O Swivel Art. Silicon Beach (Aldus) O Jujital Darkroom V2.0 O Gallery Effects Classic Art O Personal Press O Super 30 2.0 (Color). O SuperPaint 2.0 Specular International O Infini-D SuperMac Software O PixelPaint Pro Symmetry O Mariah 1.0.4 Timeworks O Publish It! Easy 2.1.1	279. 235. 182. 429. 374. 429. 294. 81. 258. 135. 328. 134. 648. 165. 465. 85.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker. O Model Shop O Swivel 3D Professional. O Swivel 3D V1.2. O Swivel 3D V1.2. O Swivel Art. Silicon Beach (Aldus) O Digital Darkroom V2.0. O Gallery Effects Classic Art. O Personal Press. O Super 3D 2.0 (Color). O SuperPaint 2.0. Specular International. O Infini-D. SuperMac Software O PixelPaint 2.1. O PixelPaint Pro. Symmetry O Mariah 1.0.4. Timeworks O Publish Itl Easy 2.1.1. Zedcor Inc O Deskpaint/Deskdraw 3	279. 235. 182. 429. 374. 429. 294. 81. 258. 135. 328. 134. 648. 165. 465. 85.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker. O Model Shop O Swivel 3D Professional. O Swivel 3D V1.2. O Swivel 3D V1.2. O Swivel Art. Silicon Beach (Aldus) O Digital Darkroom V2.0. O Gallery Effects Classic Art. O Personal Press. O Super 3D 2.0 (Color). O SuperPaint 2.0. Specular International. O Infini-D. SuperMac Software O PixelPaint 2.1. O PixelPaint Pro. Symmetry O Mariah 1.0.4. Timeworks O Publish Itl Easy 2.1.1. Zedcor Inc O Deskpaint/Deskdraw 3	279. 235. 182. 429. 374. 429. 294. 81. 258. 135. 328. 134. 648. 165. 465. 85.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker. O Model Shop O Swivel 3D Professional. O Swivel 3D V1.2. O Swivel 3D V1.2. O Swivel 3D V1.2. O Silicon Beach (Aldus) O Jigital Darkroom V2.0. O Gallery Effects Classic Art O Personal Press. O Super 3D 2.0 (Color). O Super Paint 2.0 Specular International O Infini-D SuperMac Software O PixelPaint Pro Symmetry O Mariah 1.0.4 Timeworks O Publish It! Easy 2.1.1 Zedcor Inc.	279. 235. 182. 429. 374. 429. 294. 81. 258. 135. 328. 134. 648. 165. 465. 85.
MicroFronier O Enhance 2.0 Motion Works ADDmotion Paracomp O FilmMaker. O Model Shop O Swivel 3D Professional. O Swivel 3D V1.2. O Swivel 3D V1.2. O Swivel Art. Silicon Beach (Aldus) O Digital Darkroom V2.0. O Gallery Effects Classic Art. O Personal Press. O Super 3D 2.0 (Color). O SuperPaint 2.0. Specular International. O Infini-D. SuperMac Software O PixelPaint 2.1. O PixelPaint Pro. Symmetry O Mariah 1.0.4. Timeworks O Publish Itl Easy 2.1.1. Zedcor Inc O Deskpaint/Deskdraw 3	279. 235. 182. 429. 374. 429. 294. 81. 258. 135. 328. 134. 648. 165. 465. 85.

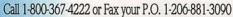
Opcode Systems	
O Book Of MIDI	29.
O EZVision	98.
 Galaxy Universal Librarian 	198
MIDI Translator	42.
OO MIDIplay	42.
O Studio 3 Midi/Smpte Int .	. 268.
70 Vision	378.
Passport Designs	
O Audio Trax	117
MIDI Interface	
O Note Writer II	
O Sound Apprentice	
O Trax	
EDUCATIONAL	
LDOCATIONAL	
Delaha Casa Tasaharatan	

Alphabet Blocks	. 29.
O Talking Tiles	. 26
Broderbund	
Calc., Geom., or Physe	a 59
7 Kid Pix	
7 Type!	
The Playroom	
Great Wave Software	
O Kidsmath	ne.
O Kidstime	
Number Maze	23.
OO B&W	25
O Color	20.
Dec. & Frac. Color	20.
70 Decimals & Fractions	25
	23.
HyperGlot Software	
C Easy Kana (Japan.)	128.
Easy Kana (Japan.) KanjiMaster-Beg (Japan.) Pronunciation Tutor French, Germa, Chinese Spanish Verbal Tutor	. 98.
Pronunciation Tutor	0
O French, German, Chinese	34.
O Spanish	134.
Verbal Tutor O Span.Fr. Ger. Word Torture 4.0 O Russ Span. Fr. Ger. Itl.	10
O Span., Fr., Ger.	.38.
Word Torture 4.0	3
Knowledge Revolution	1
Knowledge Revolution Interactive Physics	188.
Learning Company	1
Math Rabbit	30
Reader Rabbit 3	30.
MECC	
O Number Munchers	28
O Oregon Trail	28
O Word Munchers	28
Penton Overseas	
O VocabuLearn I & II Ea	24
Personal Training Syste	ms
Modules for: System 7.0, Excel,	
Word, Pagemaker, FileMaker Pri	0,
QuarkXPress, Persuasion, Freeha	and,
HyperCard, Works, Basics Ea.	\$49.
Simon & Schuster	
O Typing Tutor IV	. 28
Software Toolworks	
Mavis Beacon Typing	.32
Visionary Software	
Synchronicity V2.5	26

ENTERTAINMENT

Accolade	
Ishido: The Way of Stones	32
O Stratego	32
O Test Drive II The Duel	36
Activision	
Cosmic Osmo	39
Manhole	
Baseline Publishing	
O Talking Moose	22
Broderbund	
STATE OF THE PROPERTY OF THE P	
Ancient Art Of War	
Ancient Art Of War At Sea	25
Carmen San Diego (Europe)?	29
Carmen San Diego (Time)?	29
Carmen San Diego (U.S.A)?	
Carmen San Diego (World)?	
9,111,011,011	





O Accountant Inc.
Software Ventures

7 or my name isn't Mac." – Mac

۰		
	Playmaker Football	29.
	Robosport	36.
	Shufflepuck Cafe	24.
٠	SimCity Supreme	47
	SimEarth	39
	Casady & Greene	
•	O Cruetal Ouget & Crittor Ed	48.
٠	OO Crystal Quest 2.2	28.
	O Crystal Quest 2.2 O Mission Starlight O Sky Shadow	29.
8	Sky Shadow	29.
٠	Centron Casino Master B & W	
	Delta Tao Software Spaceward Ho! Stratogic Conquest 30 Electronic Arts Bard'S Tale Chuck Yeager's (A.F.T.) Starflight Weaver Baseball Entertainment On-Line Lottery Tracker & Wheeler	25
•	O Strategic Conquest 3.0	34.
•	Electronic Arts	
	Bard'S Tale	32.
•	Chuck Yeager's (A.F.T.)	31.
•	Starriight	39.
•	Entertainment On-Line	32.
	Lottery Tracker & Wheeler	22
	Inline Design	441
٠	Inline Design	31
	Darwin's Dilemma	31.
	OO Mutant Beach	31.
•	OO Swamp Gas	31.
	O Tesserae	31.
	Indiana Jones/Last Crusade	20
	Pipe Dream	17.
•	Mediagenic	
	Mediagenic Shanghai	18.
	Micro Laganta Sporte	
•	Micro League Baseball II	35.
٠	Microprose	
	Pirates!	35.
Ğ.	Microsoft O Flight Simulator	STORY O
•		all.
	Mindscape Balance Of Power 1990	nn
	Colony	20
•	Colony	28.
•	Deja Vu	29.
	Deja Vu Deja Vu II (Las Vegas) Uninvited New World Computing, I	29.
8	Uninvited	28.
•	Might & Magic II	nc.
•	Silicon Beach Software	30.
	O Dark Castle	32
•	Beyond Dark Castle	32.
•	Sir-Tech Software	
	Wizardry	29.
	Wizardryll Knight of Diamonds	29.
•	Wizardry Bane/Cosmic Forge	35.
•	Software Heaven	20
	Software Toolworks	20.
1	Chessmaster 2100	31
•	Cribbage King/Gin King	25.
•	Hunt For Red October	20.
	Life And Death	32.
	Spectrum Holobyte	22
•	O Falcon 2.2	33
	20 Tetris	24
1	Factor Holobyte Factor 2.2 Talcon 2.2 Talcon 2.2 Vette Vette	32.
	70 Welltris	22.
	Strategic Simulations, I	nc.
•	AD&D: Curse of Azure Bonds AD&D: Pool Of Radiance	. JD.
	Strategic Studies Group	UL.
0	American Civil War Vol 2	30
٠	American Civil War Vol 2	30.
	Halls Of Montezuma	. 28.
	Panzer Battles	28.
•	Reach for the Stars	28
•	Three Sixty Pacific Inc.	20.
	Armor Alley	.33.
	A Harpoon	39.
	Harpoon Battle Set #2 or #3	
	Harpoon Scenario Editor	

HARDWARE
Abaton O Interfax 24/96 Fax/Modem 345.
 PhotoShop - Scan 300/Color 394. Scanner 300/Color 1389.
OO Scanner 300/GS 8 Bit 998. Applied Engineering
ACHD Superdrive
DataLink Express
O DataLink LC w/Snd FAX 255. O QuadraLink
Asanté Technologies, Inc.
MacCon +30iE
MacCon+ 30iE64
MacCon+ 30iE64
MacCon+ 30iET269. MacCon+ 30iET/Vid Radius269.
MacCon+ 30iFT64 304
MacCon+ 30iETMC (Si) 378. MacCon+ 30iETMC64 (Si) 404.
70 MacCon+ IIE
O MacCon+ IIET
MacCon+ LC
Caere
O Typist
EtherPrint-T339.
Daystar Digital O Fast Cache Ilci 64K
O PowerCache Ilci 50MHz 1648. Dove
O DoveFax Desktop
MaraThon
00 030 ll w/Virtual518. 00 030 llx w/Virtual518.
90 030 Plus 398. 90 030 SE 398.
00 030 SE/30 w/Virtual 548.
MaraThon Racer 9 030 II w/Virtual1078.
00 030 Plus w/Virtual598. 00 030 SE w/Virtual598.
EVEREX EMAC 150MB Tape Backup 678.
MD2400 Baud Modem MNP-5 . 169.
Farallon PhoneNET
O Connector (10Pk)
20 DB931.
Star Connector
Star Controller
Global Village TelePort
9600 SendFax
A300 (2400 bps) 138. Harris Labs
Performer 16mHz Accel 268. Micron
O XCEED Ilci-128K (Cache Card)259.
Micron Video Cards O 8Bit MacIl - 13"/14" Mon 298.
8Bit MacII - 19* Mon
NAC
Hyper-Net Din 8
MultiSync Color Monitor HC 14"
Orange Micro
Grappler 9 Pin (C/Mac/Gs)92. Grappler Mac LX
O Mac286 Nubus Card 1069.

RasterOps 24STV SE & SE/30 Display Systems 264 SE/30 (24 Bit)	. 1239.
264 SE/30 (24 Rit)	638
Shiva Corporation	000.
60 Ethernate	1289
FastPath 4	1895
NetBridge	402
NetBridge	338.
OO Netserial	274.
Telebridge	404.
SIMM	
Single Inline Memory Modules	
OO SIMM 1 Meg 80ns	45.
OO SIMM 1 Meg 60ns	55.
SIMM 4 Meg 80ns	195.
SIMM EX 4 Mag 90ns	225
70 SIMM 1 Meg 80ns	225.
O PowerKey w/Quickeys Lite	CA
O PowerKey Remote	32
Supra Corp.	32.
Supra Modems	115
O 2400	160
O Plus 2400 (MNP5 V 42 RIS)	178
• MacPac 2400 w/MNP 5	198
Thunderware	100.
O Lightning Scan 400	379
	3/3.
Total Systems	
Gemini Classic 030 2 00Mhz 2 20Mhz 2 25MHz 3 3MHz 4 0MHz 5 50MHz 6 10 10 10 10 10 10 10 10 10 10 10 10 10	000
OO 25MHz	1179
33MHz	1448
90 40MHz	1548
00 50MHz	1688
Litterprise LU 050	
20MHz w/68882 Co	Call.
20MHz w/68882 Co 20 25MHz w/68882 Co	Call.
33MHz w/68882 Co	Call.
33MHz w/68882 Co 40MHz w/68882 Co 50MHz w/68882 Co	Call.
	Call
00 SUIVIFIZ W/00002 CU	UGII.
Gamini SF 030	
Gemini SE 030 O 20MHZ O 25MHz O 33MHz O 40MHz	
Gemini SE 030 O 20MHZ O 25MHz O 33MHz O 40MHz Wacom	768. . 1088. . 1368. . 1438.
Gemini SE 030 O 20MHZ O 25MHZ O 33MHZ O 40MHZ Wacom U2X12 Digitizers Cordless Style	768. . 1088. . 1368. . 1438.
Gemini SE 030 O 20MHZ O 25MHZ O 33MHZ O 40MHZ Wacom U2X12 Digitizers Cordless Style	768. . 1088. . 1368. . 1438.
Gemini SE 030 O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Style O Electro Static O Standard SY 8 Digitizer Cordless Style	768. . 1088. . 1368. . 1438. 928. 928.
Gemini SE 030 O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Style O Electro Static O Standard SY 8 Digitizer Cordless Style	768. . 1088. . 1368. . 1438. 928. 928.
Gemini SE 030 O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Stylus O Standard O Standard/Firm Pressure O Standard/Firm Pressure	768. . 1088. . 1368. . 1438. 928. 928.
Gemini SE 030 O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Style O Electro Static O Standard 6 X 9 Digitizers Cordless Style O Standard/Firm Pressure Zoom Telephonics	768. . 1088. . 1368. . 1438. 928. 928. 558
Gemini SE 030 O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Style O Electro Static O Standard 6 X 9 Digitizers Cordless Style O Standard/Firm Pressure Zoom Telephonics	768. . 1088. . 1368. . 1438. 928. 928. 558
Gemini SE 030 O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Stylus O Electro Static O Standard O Standard/Firm Pressure Zoom Telephonics O Modem 2400 V.42bis Ex	768. . 1088. . 1368. . 1438. 928. 928. 558. t . 168. Fax 92.
Gemini SE 030 O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Style O Electro Static O Standard O Standard Style O Standard O Standard O Modem 2400 V.42bis Ex O Modem 2400 V.42bis Ex O Modem 2400 V.32 Turbo Mac Pa	768. . 1088. . 1368. . 1438. 928. 928. 558. t . 168. Fax 92.
Gemini SE 030 O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Style O Electro Static O Standard O Standard Style O Standard O Standard O Modem 2400 V.42bis Ex O Modem 2400 V.42bis Ex O Modem 2400 V.32 Turbo Mac Pa	768. . 1088. . 1368. . 1438. 928. 928. 558. t . 168. Fax 92.
Gemini SE 030 O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Stylus O Electro Static O Standard O Standard/Firm Pressure Zoom Telephonics O Modem 2400 V.42bis Ex	768. . 1088. . 1368. . 1438. 928. 928. 558. t . 168. Fax 92.
Gemini SE 030 O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Style O Electro Static O Standard O Standard Style O Standard O Standard O Modem 2400 V.42bis Ex O Modem 2400 V.42bis Ex O Modem 2400 V.32 Turbo Mac Pa	768. . 1088. . 1368. . 1438. 928. 928. 558. t . 168. Fax 92.
Gemini SE 030 O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Stylus O Electro Static O Standard Standard O Standard/Firm Pressure Zoom Telephonics O Modem 2400 V.42bis Ex	768. 1088. 1368. 1438. 928. 928. 928.
Gemini SE 030 O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Stylus O Electro Static O Standard Standard O Standard/Firm Pressure Zoom Telephonics O Modem 2400 V.42bis Ex	768. 1088. 1368. 1438. 928. 928. 928.
Gemini SE 030 O 20MHZ O 20MHZ O 25MHZ O 33MHZ O 40MHZ Wacom 12X12 Digitizers Cordless Stylu O Electro Static O Standard 6 X 9 Digitizers Cordless Stylus O Standard/Firm Pressure Zoom Telephonics O Modem 2400 V 42bis Ex O Modem 2400 V 32 Turbo Mac Pa HARD DRIVES CRU Case Opener/Torx Kit Internal Mounting Kits	768. 1088. 1368. 1438. 928. 928. 928.
Gemini SE 030 O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Stylu O Electro Static O Standard Standard Standard/Firm Pressure Zoom Telephonics O Modem 2400 V.42bis Ex O Modem 2400 V.42bis Ex O Modem 2400 V.42bis Ex C MU Case Opener/Torx Kit Internal Mounting Kits CRU Hard Drive Case	
Gemini SE 030 O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Stylu O Electro Static O Standard Standard O Standard/Firm Pressure Zoom Telephonics O Modem 2400 V.42bis Ex C	
Gemini SE 030 O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Stylu O Electro Static O Standard 6 X 9 Digitizers Cordless Stylu O Standard/Firm Pressure Zoom Telephonics O Modem 2400 / 42bis Ex O Modem 2400 / 9600 Snd O Zoom V 32 Turbo Mac Pa HARD DRIVES CRU Case Opener/Torx Kit Internal Mounting Kits CRU Hard Drive Case Data Port Removable Case Data Place External Hard Drives	
Gemini SE 030 O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Stylu O Electro Static O Standard 6 X 9 Digitizers Cordless Stylu O Standard/Firm Pressure Zoom Telephonics O Modem 2400 / 42bis Ex O Modem 2400 / 9600 Snd O Zoom V 32 Turbo Mac Pa HARD DRIVES CRU Case Opener/Torx Kit Internal Mounting Kits CRU Hard Drive Case Data Port Removable Case Data Place External Hard Drives	
Gemini SE 030 O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Stylus O Standard Stylus O Standard/Firm Pressure Zoom Telephonics O Modem 2400 V. 42bis Ex O Modem 2400 V. 42bis Ex O Modem 2400 V. 32 Turbo Mac Pa HARD DRIVES CRU Case Opener/Torx Kit	
Gemini SE 030 O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Stylus O Standard Stylus O Standard/Firm Pressure Zoom Telephonics O Modem 2400 V. 42bis Ex O Modem 2400 V. 42bis Ex O Modem 2400 V. 32 Turbo Mac Pa HARD DRIVES CRU Case Opener/Torx Kit	
Gemini SE 030 O 20MHZ O 20MHZ O 25MHZ O 33MHz O 40MHZ Wacom 12X12 Digitizers Cordless Stylu O Electro Static O Standard Standard Standard O Standard/Firm Pressure Zoom Telephonics O Modem 2400 V.42bis Ext O D P 170 Kit Internal Mounting Kits CRU Hard Drive Case Data Place External Hard Drives O D P 52 Mb Quantum O DP 105 Mb Quantum O DP 105 Mb Quantum O DP 110 Mb Quantum	
Gemini SE 030 O 20MHZ O 20MHZ O 25MHZ O 33MHz O 40MHZ Wacom 12X12 Digitizers Cordless Stylu O Electro Static O Standard Standard Standard O Standard/Firm Pressure Zoom Telephonics O Modem 2400 V.42bis Ext O D P 170 Kit Internal Mounting Kits CRU Hard Drive Case Data Place External Hard Drives O D P 52 Mb Quantum O DP 105 Mb Quantum O DP 105 Mb Quantum O DP 110 Mb Quantum	
Gemini SE 030 O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Stylus O Electro Static O Standard Stylus O Standard/Firm Pressure Zoom Telephonics O Modem 2400 V. 42bis Ex O Modem 2400 V. 42bis Ex O Modem 2400 V. 42bis Ex CRU Case Opener/Torx Kit	
Gemini SE 030 O 20MHZ O 20MHZ O 20MHZ O 33MHz O 40MHZ Wacom 12X12 Digitizers Cordless Stylu O Electro Static O Standard Stylu O Standard/Firm Pressure Zoom Telephonics O Modem 2400 V.42bis Ext O	
Gemini SE 030 O 20MHZ O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Stylus O Electro Static O Standard O Standard/Firm Pressure Zoom Telephonics O Modem 2400 V. 42bis Ex O DP 105 Mounting Kits O DP 105 Mb Quantum O DP 125 Mb Quantum O DP 456 Mb Quantum O DP 676 Mb WrenRun II Hemovable Syquest Hard DI Hemovable Syq	
Gemini SE 030 O 20MHZ O 20MHZ O 20MHZ O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Stylus O Electro Static O Standard O Standard/Firm Pressure Zoom Telephonics O Modem 2400 V. 42bis Ex O DP 105 Mb Quantum O DP 425 Mb Quantum O DP 456 Mb WrenRun II Removable Syquest Hard Drives O DP 44 Mb W/cartridge O DP 44 Mb W/cartridge O DP 48 Mb Wycartridge	
Gemini SE 030 O 20MHZ O 20MHZ O 25MHz O 33MHz O 40MHz Wacom 12X12 Digitizers Cordless Stylus O Electro Static O Standard 6 X 9 Digitizers Cordless Stylus O Standard/Firm Pressure Zoom Telephonics O Modem 2400 / 42bis Ex O Modem 2400 / 9500 Snd O Zoom V 32 Turbo Mac Pe HARD DRIVES CRU Case Opener/Torx Kit Internal Mounting Kits CRU Hard Drive Case Data Port Removable Case Data Place External Hard Drives O DP 105 Mb Quantum O DP 105 Mb Quantum O DP 107 Mb Quantum O DP 210 Mb Quantum O DP 215 Mb Quantum O DP 425 Mb Quantum O DP 676 Mb Wrenflun II Removable Syquest Hard Drive O DP 44 Mb w/cartridge D DP 88 Mb w/cartridge Everex Systems	
Gemini SE 030 O 20MHZ O 20MHZ O 20MHZ O 33MHz O 40MHZ Wacom 12X12 Digitizers Cordless Stylus O Standard Stylus O Standard/Firm Pressure Zoom Telephonics O Modem 2400 V.42bis Ext O D P 52 Mb Quantum O D P 52 Mb Quantum O DP 155 Mb Quantum O DP 170 Mb Quantum O DP 170 Mb Quantum O DP 210 Mb Quantum O DP 210 Mb Quantum O DP 475 Mb WrenRun II O DP 676 Mb WrenRun II O DP 676 Mb WrenRun II O DP 44 Mb W/cartridge O DP 44 Mb W/cartridge O DP 44 Mb W/cartridge Ferex Systems EMAC Metro External Drives	
Gemini SE 030 O 20MHZ O 20MHZ O 25MHZ O 33MHZ O 40MHZ Wacom 12X12 Digitizers Cordless Stylus O Electro Static O Standard Standard Standard/Firm Pressure Zoom Telephonics O Modem 2400 V. 42bis Ex O Modem 2400 V. 42bis Ex O Modem 2400/9500 Snd I O Zoom V.32 Turbo Mac Pa HARD DRIVES CRU Case Opener/Torx Kit Internal Mounting Kits CRU Hard Drive Case Data Place External Hard Drives O DP 52 Mb Quantum O DP 105 Mb Quantum O DP 105 Mb Quantum O DP 105 Mb Quantum O DP 210 Mb Quantum O DP 210 Mb Quantum O DP 25 Mb Quantum O DP 25 Mb Quantum O DP 105 Mb Quantum O DP 425 Mb Quantum O DP 425 Mb Quantum O DP 484 Mb W/cartridge O DP 44 Mb W/cartridge O DP 88 Mb W/cartridge Ferex Systems EMAC Metro External Drives EMAC Metro External Drives	
Gemini SE 030 O 20MHZ O 20MHZ O 20MHZ O 33MHz O 40MHZ Wacom 12X12 Digitizers Cordless Stylus O Standard Stylus O Standard/Firm Pressure Zoom Telephonics O Modem 2400 V.42bis Ext O D P 52 Mb Quantum O D P 52 Mb Quantum O DP 155 Mb Quantum O DP 170 Mb Quantum O DP 170 Mb Quantum O DP 210 Mb Quantum O DP 210 Mb Quantum O DP 475 Mb WrenRun II O DP 676 Mb WrenRun II O DP 676 Mb WrenRun II O DP 44 Mb W/cartridge O DP 44 Mb W/cartridge O DP 44 Mb W/cartridge Ferex Systems EMAC Metro External Drives	

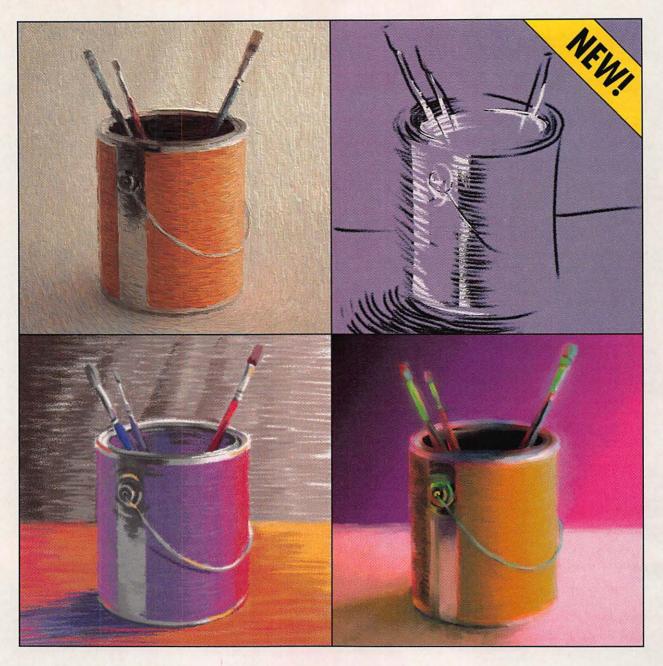
rOps .	lomega
ps 24STV1239.	Bernoulli-(Req. Kit)
730 Display Systems	Transportable 90Mb 789.
'30 (24 Bit)	O Dual Drive 90Mb 1688. O Mac Interface Kit
Corporation hergate1289.	O Tri-Pack 90Mb
astPath 4	Quantum
etBridge 402.	Low Profile ProSeries
etmodem V2400338.	ProDrive LPS 52MB 289.
etserial274.	O ProDrive LPS 105B 458.
elebridge404.	3.5" Drives ProSeries
nline Memory Modules	90 120-MEG 15ms 599. 170-MEG 15ms 698.
MM 1 Meg 80ns 45.	20 210-MEG 15ms798.
MM 1 Meg 60ns55.	20 425-MEG 15ms 1748.
MM 4 Meg 80ns 195.	Seagate Technology
MM FX 1 Meg 80ns 52. MM FX 4 Meg 80ns 225.	Full Height Drive
sticated Circuits	WrenRunner II 676 Meg 2088.
erKey w/Quickeys Lite 64.	Syquest 44 MEG Cartridges
erKey Remote32.	88 MEG Cartridges 169.
Corp.	A STATE OF THE PARTY OF THE PAR
Modems	PROGRAMMING
l lb	r no ora minimito
Pac 2400	Addison Wesley
Pac 2400 w/MNP 5 198.	Guide to Mac Family Hardware 21.
erware	Mac C Programming Vol 1 19.
ghtning Scan 400 379.	Mac C Programming Vol 2 19. Macintosh Program Secrets
Systems	MacPascal Programming Vol 1 19.
Classic 030	Programmers Online Companion 32.
Mhz998.	Inside Macintosh Series
5MHz1178.	Vol.1,2,4,5ea. 18.
3MHz1448. DMHz1548.	Vol.3
DMHz	X-REF for Vol. 1-69.
se LC 030	Inside Out Series
OMHz w/68882 Co, Call.	C++ Program w/MacApp & Disk . 19.
5MHz w/68882 Co Call.	Complete Book of HyperTalk 2 19. Elements of C++ Mac Prog 19.
3MHz w/68882 Co Call.	Mac Prog Guide MPW Vol 1 19.
OMHz w/68882 Co Call. OMHz w/68882 Co Call.	ResEdit Ref. (w/ResEdit 2.1)23.
SE 030	O System 7 Revealed18.
MHZ768.	Bantam Books
5MHz1088.	Hypercard Handbook22.
3MHz1368. DMHz1438.	Bowers Development Corp.
m	O AppMaker 1.2214.
Digitizers Cordless Stylus	Claris
	O Hypercard V2.0
tro Static	Microsoft O QuickBASIC 1.0
gitizers Cordless Stylus	Symantec
dard/Firm Pressure 558.	O Just Enough Pascal
Telephonics Indem 2400 V.42bis Ext . 168.	O Think C 5.0
lodem 2400/9600 Snd Fax 92.	O THINK Pascal 3.0
oom V.32 Turbo Mac Pack428.	O Think Reference
THE STREET STREET	TGS Systems
RD DRIVES	239.
	Ventana Press
	The System 7 Book
pener/Torx Kit8.	OO ZBasic 5.0
Mounting Kits 15.	
lard Drive Case	UTILITIES
ort Removable Case 168.	OTILITIES
I Hard Drives	Advanced Software
P 52 Mb Quantum 398.	⊘ Intouch39.
P 105 Mb Quantum 558.	O Intouch Network 3-Pack 112.
P 170 Mb Quantum 798.	Aladdin Systems
P 210 Mb Quantum 898. P 425 Mb Quantum 1848.	OO Stufflt Deluxe 2.0
P 676 Mb WrenRun II 2298.	Alsoft Diskexpress II
able Syquest Hard Drives	Master Juggler 56.
P 44 Mb w/cartridge 589.	Alysis Software Corp.
P 88 Mb w/cartridge 1088.	O SuperDisk! 56.
x Systems	ASD Software Inc.
Metro External Drives 70Mb (15ms) 1058.	• FileGuard 2.5 (10-User) 789.
10Mb (15ms) 1268.	O FileGuard 2.5 (5-User)
35Mb (16ms) 1838.	O MaccessCard Reader 295.
70Mb (16ms)2498.	Baseline Publishing O INIT Manager 33

		•	•		•		
Ber	kel	ey S	Syst	em			
2	After	Dark	2.0	k (M.)	N D A	26. 23	
ő	After	Dark	& M	A.D.	Bund	le 41	
Bri	ght	Sta	r Te	chn	olog	Y	
		ur Se				30	
		& lickDe				32	
CE	Sof	twa	re			incir d Ei	
900	Ala	rmin	g Eve	nts		83.	
99	Ca	lenda	rmak	er 3 0	0.1	31	
ő	Qu	icKey	52.1	uoie	r a. u	til 62. 89.	
000	Till	BS				68	
				Soft		e 79	
		ctix	iuxu.			/3.	
00	omp	act V	irtua	- 680	00s	72.	
		xima				45.	
000	MA	rde32				94	
O V	irtua	13.0		*****		69	
Dan	itz	Devi	elop	mer	t		
8	iemo letro	ite it spect	IPK II	or Het	rospi	ect 145. 145.	
Dat	aVi	Z					
						bl 128.	
				s V5.E nica		107.	
O E	los I	Moun	ter V	2.0		53.	
DJH	De	evel	opn	ent			
000	SC	SI Dir	recto	Pro .		95.	
Cole	II-C	or Set	20	ftwa		62	
1	lick	Chang	ge V1	.05		56.	
Far	allo	n					
Liais	on \	3.0 .		++		265	
		ene			1	118	
ő	Su	t Bac	1		1	49	
OS	uper	Lase	rSpor	12.0	44	92.	
	uper	shon	10.0			JF.	
60	Tec	chno	olog	v			
	IUF V	EYS E	olog a.ver		A	38.	
Insi	gh	De	velo	pme	ent	38	-
Insi	ight MacF	t De rint 1	velo .2	pme		3884.	
Insi O M Kiw	ight MacF	De rint 1 oftv	velo .2 vare	pme		3884.	000
Insi O M Kiw	ight MacF vi S liwiE	t De rint 1 oftv invelo	velo .2 vare	pme		3884.	000
Insi O M O K Ma	ight MacF iwiE inst	rint 1 oftv invelo	velo 2 vare pest	Inc	1	38. 84. 32. 75.	000
Insi O M Kiw O K Ma Ma	ight MacP i S iwiE inst apti	t De rint 1 oftv invelo tay ure V	velo .2 vare pest	Inc	lg .	3275.	000
Insi O M Kiw O K Ma O Ma	ight MacF iwiE inst Captu Ster	rint 1 oftv nvelo tay ure V talog	velo 2 vare pest 4.0 ubli	Inc	lg .	3275.	000
Insi O M Kiw O K Ma Ma Ma	ight MacF iwiE inst Captu Ster	rint 1 oftv nvelo tay ure V talog	velo 2 vare pest 4.0 ubli	Inc shin	19	32 75 28	
Insi O M Kiw O K Ma Ma Mic	ight MacP Vi S CiwiE inst Captu Stero 91 Vir	rint 1 oftv nvelo tay ure V talog com 1 Util	velo .2 .vare opesi 4.0 .ubli er	opme Inc	19	32. 75. 28. 89. 56.	
Insi O M Kiw O K Ma Ma Ma O C	ight MacF Vi S GiwiE Captu Stero O 91 Vir Vir Vir	rint 1 oftv nvelo tay ure V talog com 1 Util ex	velo 2 vare pest 4.0 ubli er ities	Inc shin	19	32. 75. 28. 89. 56.	
Insi O M Kiw O K Ma O M O O O O O O	ight MacP vi S iiwiE iinst Captu Captu Captu Vir Vir viros	t De rint 1 oftv invelotay ure V- rrs P ttalog 2 com 1 Util 1 Util 2 seed 3 cocker	vere vare vare vare 4.0 ubli er ities) Pak	opme Inc	19	32	
Insi O M Kiw O K Ma O M O O O O O O	ight MacF Vi S SiwiE Sapti Sapti Stero O 91 Viros Viros Stero Capti Viros Stero Capti Stero Capti Stero Capti Stero Ster	t De rint 1 oftv inveloc tay ure V- rs P talog com 1 Util ex	vere vare vare ppes! 4.0 ubli er ities) Pak	opme linc	19	32 	
Insi O M Kiw O K Mai O M Mid O M O M O M O M	ight MacF Vi S SiwiE Sapti Sapti Stero Viros Vir	t De rint 1 oftv inveloc tay ure V- rs P Trs P 1 Unil ex	velo 2 vare ppesl 4.0 ubli er ities 1 Pak Is	opme Inc	19	32	
Insi O M Kiw O K Mai O M O M O M O M O M	ight AacF vi S iiwiE inst Captu S Captu S Vir Vir Vir Vir S	t De print 1 oftware Vors P ttalog com 1 Util 1 Util 1 oftware Vors P ttalog com 1 oftware Vors P tt	velo 2 vare ppesl 4.0 ubli er ities) Pak Is	shin	9	32 75 28 89 56 359 Call 48	
Insi	MacFinsteinsteinsteinsteinsteinsteinsteinste	t De rint 1 oftv invelocitay ure V-rs P talog com 1 Util ex	velocation vare	shin 2.0 y	9	32	
Institution of the control of the co	ight MacPile M	t De rint 1 oftv invelocation 1 Util 1 communication 1 communicati	velo 2 vare ppesl 4.0 ubli er ities) Pak Is 3.0 vare ies V	opme lnc shin 20 y	ig .	32. 75. 28. 89 56. 359 Call. 48. 69 75.	
Institution of the control of the co	ight MacFris SiwiE institute Saptus S	De print 1 oftv nvelctay tres P talog com 1 Util ex oftv tian chicker tian e Graf t	velo 2 vare ppes! 4.0 ubli er iities 1) Pak 1s 3.0 vare ies V	shin 20 y	lg re	32. 75. 28. 89 56. 359 Call 48. 69. 75. 32.	
Insi	ight MacF vi S instance instance Captur Cap	De print 1 oftv invelocitay ure V-rs P ttalog com 1 Util tex oftv Utilitichnocation tian a Gratta t	vere vere vere vere vere vere vere vere	shin 20 y	lg re	32. 75. 28. 89 56. 359 Call. 48. 69 75.	
Inside the second of the secon	ight MacF vi S SiwiE inst Captu Sterio Captu Sterio Captu Vinst Piedu W S low Terio On Lo Cast image ien Disk l	t De trint I De trint	velo 2 vare ppesl 4.0 4.0 ities ities ities 3.0 vare ppesl yare yare	shin 220 y twa 27	ig re	32 75. 28. 89 56. 359. Call, 48. 69. 75. 32.	
Inside the second of the secon	ight MacF vi S GiwiE Gapti Scapti Capti Stero O 91 O Viros O 10 O Viros O 10 O Viros O 10	t De trint I De trint	velo vare vare ppesl 4.0 ubli er ities 3.0 Sof bber Sof bber (6.0)	shin shin 2.0 y	ig re	32 75 28 89 56 359 Call 48 69 32 49 68	
Inside the second of the secon	ight MacF vi S GiwiE Gapti Scapti Capti Stero O 91 O Viros O 10 O Viros O 10 O Viros O 10	t De trint I De trint	velo vare vare ppesl 4.0 ubli er ities 3.0 Sof bber Sof bber (6.0)	shin shin 2.0 y	ig re	32 75 28 89 56 359 Call 48 69 32 49 68	
Inside the second of the secon	ight MacF vi S GiwiE Gapti Scapti Capti Stero O 91 O Viros O 10 O Viros O 10 O Viros O 10	t De trint I De trint	velo vare vare ppesl 4.0 ubli er ities 3.0 Sof bber Sof bber (6.0)	shin shin 2.0 y	ig re	32 75 28 89 56 359 Call 48 69 32 49 68	
Inside the second of the secon	ight MacPy is American in the control of the contro	De trint 1 oftv nvelctay rrs P talog	velous vare ppes l 4.0	shin shin 2.0 y twa 2.0 7	re	32 75. 28. 89. 56. 359. Calil. 48. 69. 75. 32. 49. 68.	
Inside the second of the secon	ight MacPy is American in the control of the contro	t De trint 1 oftware Vers P talog com 1 Utilit ex 10 cation cation to the cation to th	velove ve	shin 220 y twa 27	re	32 75. 28. 89. 56. 359. Call, 48. 69. 75. 49. 68. 1388.	
Inside the control of	ight MacFy i ShiwiEi Capti Stea C	t De trint 1 oftv nvelctay ure V- rs P talog com 1 Util ex	velocation of the second of th	shin 2.0y y twa 77	re	32 75. 28. 89. 56. 359. Call, 48. 69. 75. 49. 68. 1388.	
Inside the second of the secon	ight MacS MacS iwite inst Capturity Orange Orange Indian	t De print 1 oftvenvelctay ure Vers P oftvenvelctay 1 Util ex oftvenvelctalog com 1 Util ex oftvenvelctalog cation t chine dater errita dater errita dater looff marc looff marc looff looff looff looff looft l	velo 2 vare vare ppesl 4.0 ubli er iities) Pak is is is (6 Us Sol Sol Sol Sol	shin shin 2.0 y twa 7	re	32 75. 28. 89. 56. 359. 48. 69. 75. 32. 49. 68. 1388. 48.	
Inside the second of the secon	ight MacFire S instance	t De print 1 oftvernvelot tay ure V-tree V-t	velc 2 vare vare vare vare ities 3 0 Sof bber Sof (6 Us Sof Sof Sof Sof Sof Sof Sof Sof	shin shin 2.0 y twa 7 ovati	re	32. 75. 28. 89. 56. 359. Call. 48. 69. 49. 68. 1388. 48. 58. 83. 64	
Inside the second of the secon	ight MacFinis Institute In	t De print 1 Offtverser 1 Offtv	velce 2 vare population of the control of the contr	shin shin 2.0 y twa 2.0 7	re	32. 75. 28. 89. 56. 359. 48. 69. 32. 49. 48. 48. 58. 48. 58.	
Insi O M Kiw Maa O M M M M M M M M M M M M M M M M M	ight MacFinis Captui S Captui S Captui S Captui S Captui S Captui P Captui	t De print 1 oftv nvelctay ure V- res P talog com 1 Utili res 0 oftv Utilit chno catio	velocation	shin shin shin 2.0 y twa 2.0 y	ons re	32. 75. 28. 89. 56. 359. 48. 69. 32. 49. 48. 48. 58. 48. 58.	

7, we've tried it." -Mac

Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090





Other Paint Programs Pail by Comparison

Fractal Design Painter™ duplicates traditional tools and textures in 24-bit color for expressive, natural results. Use one of Painter's dozens of drawing and painting tools, like charcoal, felt pens, crayons, pencils and oil brushes. Choose cotton bond, canvas or others from its palettes of

paper textures. Paint right away with the brushes Painter provides, or design your own, by adjusting size, angle and thickness of stroke. Painter is the ideal program for fine artists venturing into color desktop graphics, for business professionals to add artistic flair to slides and presentations, for designers to rough out a concept on their computer, or for anyone to clone an existing image in outrageous new styles (that's how we made the four cans

above; pretty nifty, eh?). Painter supports the Wacom pressure-sensitive stylus. And at only \$299, the price is as realistic as the results you get. Just look for the paint can.



Copyright © 1991 Fractal Design Corporation. Fractal Design Painter is a trademark of Fractal Design Corporation, 101 Madeline Drive, Suite 204, Aptos, CA 95003, (408) 688-8800.

Getting Started with Customizing Databases

HOW TO FINE-TUNE YOUR ELECTRONIC FILING SYSTEM FOR ACCURACY AND EFFICIENCY

Demember "The Lucy Show," in which the

zany redhead was secretary to a bank president, one Theodore J.

Mooney? Few things pushed Mr. Mooney's blood pressure to the

bursting point more than being unable to fathom Lucy's ditzy

filing system, in which the Jenkins file was under "N" ("because he's such a *nice* man") and the Smith file was under "T" ("you meet with him on Tuesdays"), but Lucy could always find things in a flash.

There's a moral to this story: The best filing system is one that's tailored to the way you work. This also applies to the electronic filing systems you can create using database managers such as Claris's FileMaker Pro, ACIUS's 4th Dimension and File Force, Odesta's Double Helix, ProVue's Panorama, or the data-management features in Microsoft Works and Excel. Most database managers provide dozens of features that enable you to customize a filing system—to help ensure the accuracy of your data and to help you locate, sort, and print it more easily.

But many database users don't bother to investigate these customizing options; instead they rely on the data manager's preset, out-of-the-box settings for entering, storing, sorting, and printing information. If you are a member of this group, you aren't getting the most from your software, and you are probably working harder than you need to. This month I examine the ways you can customize a database with most Macintosh data-

base managers. "Customizing a File-Maker Pro Database" shows how to apply these concepts to the most popular Mac data manager, Claris's FileMaker Pro.

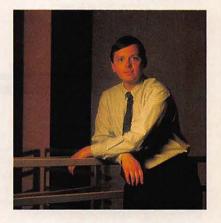
BY JIM HEID

Preparing the Fields

Database customizing begins with choosing the appropriate types of fields for the data you store. (In database parlance, a *field* is a single piece of information, and a group of related fields form a *record*. Think of a Rolodex file: one card compares to a record, while the individual pieces of information on the card—name, address, phone number—compare to fields.)

When you create a new database, you give each field a name that reflects its contents, such as Last Name or Zip Code. You can also specify what kind of data that field holds—text, numbers, or dates, for example. Most database managers are preset to create text fields, and if you're in a hurry to start filing, you might just accept that setting as you define each field. Don't do it—think about the type of data each field will hold, and specify field types accordingly.

Choosing the right field type is especially important when you know those fields will hold numbers or date



values. Although you can store numbers or dates in a text field, it isn't a good idea. Most data managers can apply calculations to the values in a number field—adding a sales tax percentage to a subtotal to arrive at a grand total, for example—but they can't calculate numbers stored in a text field. And if you store date values in a text field, the database manager can't sort the dates accurately. To a text field, "August" comes before "March," but a date field knows better.

Using the right types of fields also helps ensure your database's accuracy. A data manager won't let you enter a nonnumeric value (such as a lowercase *l* instead of a 1) in a number field, nor will it permit you to put impossible dates such as February 31 in date fields.

When creating a database for addresses, many people make the mistake of using a number field to hold zip codes. Eight states (as well as Puerto Rico) have zip codes that be-(continues)

CUSTOMIZING A FILEMAKER PRO DATABASE

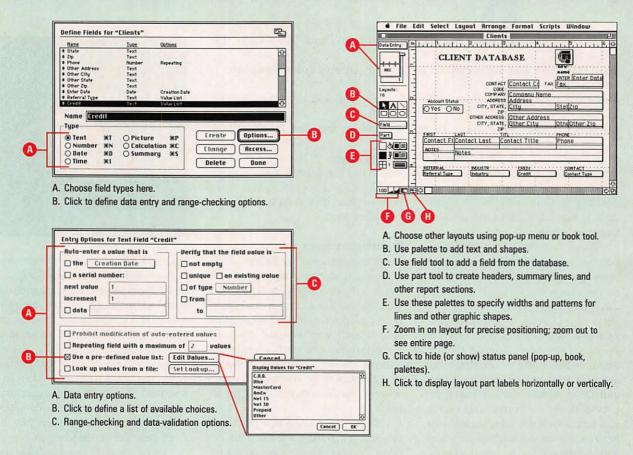
ere are some ways to apply the customizing techniques described in this column to a FileMaker Pro database. For these examples I've used a simple client database, but you can apply these tips to any type of database.

Phase 1: Defining fields and entry options. FileMaker Pro provides a variety of field types, and choosing the right one is a matter of clicking on a button or, faster still, typing a % -key shortcut when defining the field. To specify a range, a list of choices, or other data entry options, click on the Options button or simply press the return key right after defining the field.

Phase 2: Laying out forms and reports. FileMaker Pro lets you create as many layouts as you like and switch between

them using a pop-up menu. The program names a new layout with a number (Layout 1, Layout 2, and so on); rename it something more descriptive. To create radio buttons or check boxes for a field based on a list of values, select the field and choose Field Format from the Format menu, then choose the desired options. You can also use a layout to provide several screens of help information. Name such a layout Help, and users can view your online help by choosing its name from the layout pop-up menu. Many of the sample databases included with FileMaker Pro use this technique.

Phase 3: Creating scripts and buttons. The example button shown here, when clicked on, executes a FileMaker Pro script



gin with 0, and a number field generally lops off a *leading zero*, leaving just the last four digits. And many non-U.S. postal codes contain a mishmash of letters and numbers. (Using a text field for zip codes will also allow you to enter a hyphen if you use ninedigit zip codes.)

Can you change a field's type if you realize that, say, a text field really should be a date field? Generally, yes, but depending on the program, you may lose some or all of the data in that field. For example, ACIUS's File Force and 4th Dimension retain the contents of a changed field type, but Odesta's Double Helix erases them. FileMaker Pro retains the first 255 characters of each field if you change a text field to another type. Clearly, it's far better to determine each field's type *before* you start entering data.

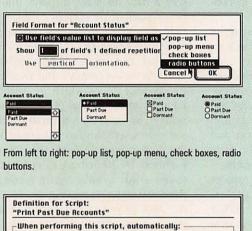
Accuracy Counts

A database is only as useful as it is accurate. A typo in a field can cause a record to be sorted incorrectly, or not found during a search. And if the field contains numbers—an employee's hourly wage, an item's price, or its quantity—the inaccuracy could cost you money. No database manager can ensure 100 percent accuracy, but most programs have features that

that finds all clients whose accounts are past due and then prints a report listing their names. The first step in setting up an automated activity is to create the script: choose Define Script from the Scripts menu, give the new script a name, and then check the steps that the script should perform. Uncheck the Include in Menu box when you do not want the script's name and \$\mathbb{H}-key\$ shortcut to appear in the Scripts menu. Uncheck the box if you want the script to be executed only when a button is clicked on.

After defining the script, you can assign a button to it. First, create the new button by typing its text and then drawing a round-corner rectangle large enough to accommodate the text.

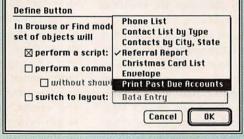
For a flashier look for buttons that perform common functions such as adding a new record or searching, copy one of the button designs from FileMaker Pro's Buttons template. Or create your own design in a paint or draw program, copy it to the Clipboard, and then paste it into the desired form when in layout mode. (If you want the custom button to contain a text label, be sure to make the button large enough.) Next, while still in layout mode, select the button and choose Define Button from the Scripts menu. In the Define Button dialog box, click on the Perform a Script check box, and then select the desired script's name from the pop-up menu. Click on OK, switch back to browse mode, and try the new button.





- A. When this box is checked, the script name appears in the Scripts menu.
- B. When this option is selected, the program uses the Find options that were in effect when the script was created.





A. Selected objects will be defined as a button.

guard against certain kinds of mistakes and that make it easier to enter frequently used information.

Entry-checking features are data entry proofreaders that compare what you enter to a list or range of acceptable values. Say you're creating a personnel file containing a Department field. If your company has four departments, you can specify that the program reject anything other than their names (see "Labor Savers"). Many programs also let you specify *input patterns*, series of characters that affect text you type. For example, an input pattern for a Telephone Number field might read (nnn) nnn-nnnn. When you enter data into a field with this pattern, you can simply type ten numbers, and the data manager inserts the parentheses and hyphen for you. And if you type anything other

than ten numbers a message notifies you of the error.

Range checking ensures that numbers or dates are within a specified range. If you know the price of a Type A Widget is always between \$10.95 and \$12.95, you can assign that range to the Price field. Attempt to enter a price outside that range, and you'll see an error message.

(continues)

HOW TO





LABOR SAVERS Automatic data entry and data-validation options reduce repetitive typing and help eliminate inaccurate data. At top, a pattern for a phone-number field is being specified with ACIUS's 4th Dimension. At bottom, Odesta's Double Helix's flag fields can hold only one of two possible values—here, "male" or "female."

In many databases, the contents of certain fields stay the same from one record to the next. (Most of a company's employees may live in the same state, for example.) To streamline data entry, most programs can enter data into certain fields for you when you create a new record. Most programs can also carry over information from corresponding fields in the previous record. For those times when the data differs, you can replace automatically entered data by simply backspacing over it. And ProVue Development's Panorama and forthcoming Panorama II boast a love-itor-hate-it feature called clairvovance-if you type "San F" and a previous record contains "San Francisco," the program inserts the rest of the text for you. You can override the guess by simply continuing to type, or you can just turn off the feature.

Certain types of fields—ones that list marital status, sex, or whether an account is past due—contain one of only two possible values. Other types of fields are based on a rigid list of values—such as the list of colors available for Type A Widgets or the expense categories in a budget database. Most database programs allow you to specify these kinds of restrictions, and

to select a value from a list of options by clicking on on-screen buttons or check boxes. Use these multiplechoice features to improve accuracy and eliminate the drudgery of repeatedly typing the same values.

Changing the Look of Things

When you start a new database, most programs create a simple on-screen form you can use to start entering and retrieving data. But preset forms bear nothing but fields and the *labels* that identify them. By creating and switching between several customized forms, you can make the database easier to work with and print its contents in a variety of formats.

Macintosh database managers have layout features that encroach on desktop publishing territory (see "Designing Data"). You will find onscreen measuring rulers and T-squares and tools for drawing lines, circles, and boxes. You can also add text and graphics such as a company name and logo. And you can change the font, style, and size of fields and labels.

But all these layout tools make it easy to create graphically tasteless forms. These won't present your data in the best light, and they make data entry—never a picnic anyway—more arduous. Since most data managers let you create numerous forms and switch between them, I recommend creating separate forms for data entry and for printing.

Make the data entry forms simple, without a lot of extraneous text and graphics. If several people will be entering data, consider adding help text to guide less experienced users through the process. Try to position fields so that you can review data and move between fields without having to scroll; besides showing an entire record at once, this helps prevent people from accidentally skipping over fields they can't see. And use fonts that are designed for the Mac's limited screen resolution, such as New York and Geneva. Laser-printer fonts such as Times and Helvetica aren't as legible on screen.

For forms that you'll use for laser printing, the opposite applies—avoid fonts such as New York, Chicago, and Geneva, which don't laser-print well. Many graphic designers recommend sturdy, sans serif fonts such as Helvetica and Franklin Gothic for forms. Position fields to take advantage of the paper size you're using; since scrolling isn't an issue for printing, don't let yourself be hemmed in by the size of the Mac's screen. If you are printing on preprinted forms such as invoices or label stock, use the program's rulers to position items so they appear in the proper place. Throw in some graphic embellishments if you like; let your creative juices flow—but not gush.

One more noteworthy point about field formatting concerns the way a data manager displays numbers—particularly currency values that are calculated by the program. Most data managers calculate numbers that are accurate to up to 15 decimal places-impressive, but overkill for currency values, which are usually limited to two decimal places. If you print an invoice or any form in which some currency values are calculated by the data manager, specify that those numbers be formatted as currency values-with a dollar sign preceding them and with only two numbers after the decimal point. This ensures that you won't see strange values such as \$25.94847267.

Tying It Up, Tying It Down

Now that you have done some serious fine-tuning, what's left? Creating



DESIGNING DATA This FileMaker Pro layout contains elements common to most database reports: fixed text (the word invoice and the labels Bill to and Ship), fields and field labels, and borders and lines to group together related pieces of information. The list of items purchased is generated from a group of repeating fields, fields that can hold numerous separate values within each record. Repeating fields are ideal for an invoice's list of items purchased because one record represents a single purchase of numerous items.

on-screen buttons or pull-down menus that allow anyone who uses your database to conduct common types of searches or to access various forms and reports with a click of the mouse.

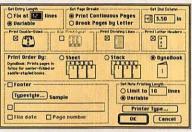
Say you search a client database every Friday to print a list of new orders. With most data managers, that involves choosing a Search or Find command, typing search criteria, clicking on a button or choosing another command, then choosing Print. Automating repetitive chores like these makes the database more convenient to work with and enables inexperienced users or temporary employees to perform complex jobs without having to know every nook and cranny of the program.

Basic filing programs such as Microsoft File and Software Discoveries' RecordHolder Plus don't have the features needed to automate tasks, but nearly every other data manager offers some step-saving capabilities. Panorama, Microsoft Works, and Excel all have macro recorders. When you activate recording, the program records your actions, creating macros you can save on disk and replay later. Panorama and Excel let you list macros in a menu and create on-screen buttons that play macros when clicked on. Both programs also let you create your own dialog boxes that you might use to get information (such as some text to search for) or to display messages.

But the kings of database automation are programmable database managers, such as Double Helix, 4th Dimension, Blythe Software's Omnis 5. Oracle Corporation's Oracle for Macintosh, and Fox Software's Fox-Base+/Mac. These powerhouse programs provide programming features that let you create your own dialog boxes, menus, windows, buttons, and other Macintosh interface elements. Consultants, developers, and data processing professionals use these programs to create turnkey database applications that they customize to meet the needs of specific professions or departments so the end users won't have to.

These powerhouse programs are also *relational* database managers: they enable you to establish links







ELECTRONIC ADDRESS BOOKS Address-book programs such as Portfolio Systems' DynoDex (shown here), PowerUp Software's Address Book Plus, and After Hours Software's Touch-Base combine basic data-management features with the ability to dial the telephone and to quickly print mailing labels, envelopes, rotary-file cards, and custom address books. At top is DynoDex's data entry form and Just Names window, which lists only the names in a database and lets you jump to a given record by clicking on its name. At middle, the Print Options dialog box lets you specify the format for a custom phone book. At bottom is a sample phone book in the Print Preview window.

among numerous files and create forms and reports containing data from them. These database-management programs also support *Structured Query Language*, or *SQL*. An English-like data-retrieval language developed in the 1970s by IBM, SQL is popular in the minicomputer and mainframe worlds. Data managers that support SQL enable developers to create Macintosh *front ends* for databases that run on huge computers, so that users can access those powerful but formidable systems through a friendly Mac interface.

But few people need the full range of features programmable databases provide, and most are understandably intimidated by the complexities of relational-data management. Flat file programs—so named because they work with just one file at a time—such as FileMaker Pro and Panorama combine the most commonly used data-management features with more accessible programming capabilities. And like high-end database managers, they support networks, allowing an office to share a single database.

If your data-management needs revolve around names and addresses, you might consider an electronic address-book program such as Portfolio Systems' DynoDex, PowerUp Software's Address Book Plus, or After Hours Software's TouchBase (see "Electronic Address Books"). All three sport basic address-book essentials such as automatic phone dialing and the ability to format and print envelopes and labels. TouchBase also provides more advanced features, including customizable fields and search criteria, as well as network support that allows an office to share a single contact database. And although HyperCard doesn't have important datamanagement features such as different types of fields, it can search for and sort data, and it's easy to use and customize. And its free-form approach to fields may be more suitable for databases that contain a large amount of text.

But whichever database manager you use, take the time to learn its customizing features so you can finetune the databases and reports you create. Not only will you eliminate a lot of drudgery and make it easier to find and use your data, but—like Lucy—you'll end up with a system that fits your own peculiar needs, not someone else's.

See Where to Buy for contact information.

Contributing editor Jim Heid looks at a different aspect of Mac fundamentals each month. His latest book, Macworld Complete Mac Handbook, an updated and expanded collection of more than 40 Getting Started columns, was recently published by IDG Books Worldwide.

Look for Offical Macworld Books nationwide at:

B. DALTON BARNES & NOBLE BOOKSTOP/ BOOKSTAR SOFTWARE ETC. WALDENSOFTWARE WALDENBOOKS

Alaska

BOOK CACHE All locations including Anchorage BAKER AND BAKER

BOOKSELLERS Fairbanks

Northern California CAPITOLA BOOK CAFE

Capitola A CLEAN

WELL LIGHTED PLACE Cupertino

THE BOOKSMITH San Francisco

STACEY'S BOOKSTORE Cupertino Modesto Palo Alto San Francisco (2 locations)

TOWER BOOKS Chico Citrus Heights Concord Mountain View Sacramento (3 locations) San Mateo

WHOLE EARTH ACCESS Concord San Francisco San Iose San Mateo San Rafae

CODY'S BOOKS Berkeley

COMPLETER LITERACY BOOKSHOPS Cupertino San Jose Sunnyvale

GAYLE'S BOOKS Davis

UCD BOOKSTORE Davis

STANFORD BOOKSTORE Palo Alto Stanford

AARDVARK BOOKS San Francisco

FOLEY'S BOOKS San Francisco

FRANCISCAN SHOPS San Francisco

COMPUTER LITERACY

COPPERFIELD'S BOOKS

Santa Rosa

Southern California

HUNTLEY BOOKSTORE Claremont

UCLA BOOKSTORE Los Angeles USC TROIAN

BOOKSTORE Los Angeles

OPAMP TECHNICAL BOOKS Los Angeles

VROMAN'S Pasadena

SAN DIEGO TECHNICAL BOOKS San Diego

UNIVERSITY BOOKSTORE San Diego UNIVERSITY BOOKSTORE

La Jolla Colorado

UNIVERSITY BOOKSTORE Greelev

TATTERED COVER BOOKSTORE Denver

COLORADO BOOK STORE Boulder

Connecticut

HUNTINGTON' BOOKSTORE Hartford

R.I. JULIA BOOKSELLERS Madison

VALE CO-OP New Haven

BOOKS UNLIMITED Rocky Hill

U CONN CO-OP Storrs

District of Colombia

REITER'S SCIENTIFIC & PROFESSIONAL BOOKS Washington

REPRINT BOOK SHOP Washington

National

Bestseller

Georgia

OXFORD BOOKSTORE

DOUGLASVILLE BOOKS Douglasville

Hawaii

HONOLULU BOOK SHOPS Honolulu

Illinois

PAGES FOR ALL AGES BOOKSTORE Champaign

57TH STREET BOOKS Chicago

KROCH'S & BRENTANO'S Chicago

READMORE BOOKWORLD Rock Island

BOOKWORLD III Rockford

BOOK CENTER IN ILLINI UNION Urbana

LORA & WALLY GRICC BOOKSELLERS Woodstock

BOOKS ON THE SQUARE Woodstock

UNIV. BOOKSTORE IOWA MEMORIAL UNION Iowa City

CHARLESBANK

Boston

Brookline

Cambridge

Cambridge

Hanover

Michigan

Birmingham

BOOK WORLD

Grand Rapids

BOOKSHOP AT BU

BARILLARI BOOKS

BROOKLINE BOOKSMITH

CAMBRIDGE BOOKSMITH

PAPERBACK BOOKSMITH

METRO NEWS CENTER

Indiana

HORIZON BOOKS Indianapolis BOOK CORNER

Bloomington BOOK WORLD Mishawaka

BALL STATE UNIVERSITY BOOKSTORE Muncie

Kansas

CROSSROADS Hutchinson UNIVERSITY BOOK STORE Manhattan

HARBOUR BOOKS Flint Yarmouth

Maryland

SIDNEY KRAMER BOOKS

Massachusetts

Rockville

OR

WORDS WORTH Cambridge

LITTLE PROFESSOR BOOK CENTER

BOOKSELLERS

BOOKWORM FASTRROOK MALL Grand Rapids

O'NEILL & AUSTIN BOOKSELLERS

Dearborn YOUNG & WELSHANS

MACGREGOR NEWS Mt. Pleasant

Rochester Hills

Master Your

acintosh With

lacworld Books!

READ ME FIRST BOOK

Macworld Read Me First

Macworld's experts help you choose, buy, and use the best

Mac equipment and software. \$22.95 US/\$29.95 Canada, 320 pgs

Macworld Guide to System 7

Macworld Complete Mac Handbook

The ultimate guide to getting started, mastering, and expand-

ing your Mac from Jim Heid. \$26.95 US/\$35.95 Canada, 548 pgs

Macworld Music And Sound Bible

music, sound, and multimedia. \$34.95 US/\$46.95 Canada, 1,024 pgs

If you can't find Macworld books, call 1-800-282-6657 (9-5 EST). For

MAVERICK BOOKSTORE

NEBRASKA BOOKSTORE

UNIVERSITY BOOKSTORE

DARTMOUTH BOOKSTORE

New Hampshire

more information, call IDG Books at (415) 358-1250.

Minnesota

BAXTER BOOKS

Minneapolis

ODEGARD BOOKS

Mankuto

SAINT PAUL

St. Paul

Nebraska

Lincoln

Lincoln

Hanover

Mac music guru Christopher Yavelow's ultimate guide to

Mac expert Lon Poole reveals undocumented features, 100's

of tips and techniques. \$24.95 US/\$33.95 Canada, 356 pgs

New Jersey

McGraw HILL Hightstown

BARNARD BOOK FORUM New York City CLASSIC BOOVSHOP NYC (2 locations) COLISEUM BOOKS New York City McGraw-Hill

BOOKSTORE New York City

MACWORLD

COMPLETE MAC'HANDBOOK

UNIVERSITY OF OREGON BOOKSTORE Eugene POWELL'S BOOKSTORE AT CASCADE PLAZA Beaverton

THE OHIO STATE

Columbus

Dayton

Dayton

Oregon

BOOK STORES

BOOK MARK

Corvallis

Eugene

BOOKS & CO.

WILKIE'S SOUTH

OREGON STATE UNIV.

UNIVERSITY BOOKSTORE

POWELL'S TECHNICAL BOOKSTORE Portland

REED COLLEGE BOOKSTORE Portland

Pennsylvania

THE BOOK STORE Philadelphia

THE BOOK CENTER Pittsburgh

Tennessee

ZIMMERMAN'S BOOKS Johnson City BOOKWORLD Nashville

PRNT BOOKSTORE AT INFOMART Dallas

BROWN BOOK SHOP Houston SAM HOUSTON BOOK

SHOP Houston

UNIVERSITY CO-OPERATIVE SOCIETY Austin

BOOKSTOP All locations, including Austin

TAYLORS TECHNICAL BOOKS: Dallas (4 locations) Ft. Worth Plano

J.A. Majors Houston

Utah

BYU BOOKSTORE Provo

Washington

TOWER BOOKS Bellevue Seattle

PAPYRUS BOOKSELLERS

New York City

New York City

North Carolina

ATTICUS BOOKS

WILKIES UNIVERSITY

WIT & WISDOM

Beachwood

Rocky River

Greensboro

Ohio

SHOPPES

Fairborn

TOWER BOOKS

(2 locations)

UNIVERSITY BOOKSTORE Bellevue

ELLIOTT BAY BOOK Seattle

UNIVERSITY BOOK STORE Seattle

Wisconsin

CONKEY'S BOOK STORE Appleton

HARRY W. SCHWARTZ Milwaukee

CANADA Alberta

THE BOOK COMPANY BANKER'S HALL Calgary

CALGARY COMPUTER ROOKS

Calgary

AUDREY'S BOOKS Edmonton

GREENWOOD'S ВООКЅНОРРЕ Edmonton

SOFTWAREHOUSE (WEST) Edmonton

British Colombia

UNIHALL COMPUTER BOOKS CO. LTD. Vancouver

GRANVILLE Воок Со. Vancouver

SILICONNECTIONS BOOKS Vancouver

BOLEN BOOKS Victoria

Nova Scotia

THE BOOK COMPANY ENTITLEMENT Halifax

Ontario

COLES BOOK STORES Available at all

W.H. SMITH STORES Available at all locations

LICHTMAN'S STORES Toronto (5 locationa) Thornhill

THE BOOK COMPANY PROSPERO BOOKS Ottawa

ODYSSEY COMPUTER & BUSINESS Ottawa

ALBERT BRITNELL

BOOKS FOR BUSINESS Toronto

WORLD'S BIGGEST BOOKSTORE Toronto

UNIVERSITY OF TORONTO BOOKSTORE Toronto

UNIVERSITY OF WATERLOO BOOKSTORE Waterloo

Quebec

CAMELOT-INFO COMP. BOOKS & SOFTWARE Montreal

ROSWELL COMPUTER BOOKS Montreal

Saskatchewan

BOOK & BRIER PATCH Regina



IDG BOOKS WORLDWIDE 155 BOVET ROAD, SUITE 730 SAN MATEO, CA 94402 (415) 358-1250

Circle 227 on reader service card

Insights on Adobe Illustrator

TIPS AND TRICKS FOR ILLUSTRATOR ADVENTURERS

BY STEVE ROTH

hen Adobe Illustrator first came out, it was

a revelation to Mac and PostScript users. The first truly professional illustration program for the Mac, it was as much a trail-blazer as those early PostScript printers (like the one I still use).

It's remarkable how much the program could do even then.

Now, two upgrades later, we're at version 3.01 of both Illustrator and the accompanying Separator. Though these tips work with version 3.0, I recommend getting the 3.01 upgrade for its increased stability and compatibility with other programs.

Clone in Place

There's still one important command missing from Illustrator 3, an omission that often confuses people—the Clone command, which lets you make a copy of an object directly on top of the original. You can accomplish this by selecting the object, pressing \$\mathbb{X}\$-C, followed by \$\mathbb{X}\$-F (paste in front).

Copy and Move Incrementally

Illustrator lets you move an object incrementally using the cursor keys, and you can copy an object and move the copy by holding down the option key and dragging the object with the mouse, but how do you combine the two—keyboard movements and the copy/move trick? To copy an object while moving it incrementally, hold down the \(\mathbb{H}, \) option, and shift keys while moving the object with the cursor keys.

Giving Templates the Brush-Off

It's always been annoying that every time you open a new file, Illustrator



insists on asking which template you want to use—even if you're not planning on using one.

To avoid the annoyance of that extra dialog box, just hold down the option key while choosing New from the File menu, or just press option-\$\mathbf{X}\$ -N. The same holds true when you're opening a file that has a template. If you want to get rid of the template, hold down option while choosing Open, or press option-\$\mathbf{X}\$-O.

Kerning and Tracking Values

Illustrator 3 provides some of the best type controls around, including the critical areas of kerning and tracking. If you want to see what kerning and tracking values have been applied to text, either click on an insertion point or select a range of text, then hold down the option key. Illustrator displays the kerning and tracking values in the lower-left corner of the window (see "A Question of Values"), but you

won't be able to edit them there.

Kerning on the Edge

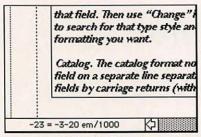
One unusual feature of Illustrator's kerning is its ability to kern letters in from the left and right edges of a text block. Just place the text cursor at the beginning or end of a line (except at the beginning of the first line of a text block), and kern

characters in from the edge using the option and the right arrow keys (see "Kerning Edges"). This feature makes it easy to position individual lines of text precisely, without moving the whole text block.

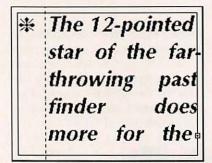
Transforming Your Guides

The Illustrator manuals make clear that you can grab a guide and move it by holding down shift-control. What they don't make clear, and what is hard to see on screen, is that when you shift-control-click on a guide, that guide is selected; you can then rotate it, move it, and skew it to your heart's content.

(continues)



A QUESTION OF VALUES When the cursor is inserted in text or a range of selected text, hold down the option key to see the kerning and tracking values in that text.



KERNING EDGES The bottom four lines in this text block have been kerned over from the edge to allow for the hanging dingbat.

Graphic Tabs

While Illustrator 3's paragraph formatting is a step up from previous versions, there's one thing that doesn't seem to work—tabs and tab stops. In fact, though, you can take advantage of a great hidden feature that Adobe calls graphic tabs. This feature lets you use any shape to define the tab stops for a block of text (see "Graphic Tabs"). You can use a normal straight line or an angled or curved one, with some limitations (discussed below). Before we cover those, however, here's a step-by-step run-through of the procedure.

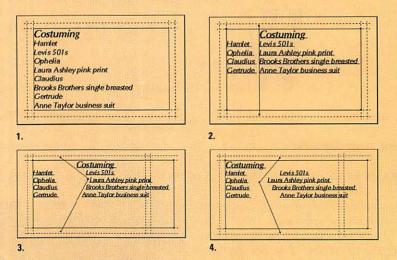
1. Create a block of text by dragging out a rectangle with the text tool and then typing. Make it a numbered list, a table, or some other piece that needs accurate tab alignment. Place tabs before any text that needs to be tab-aligned.

At this point, each tab that you insert causes the line to break—like a carriage return. Don't worry, be happy, and go on to the next step.

Using the pen tool, draw a vertical line through the text block at the point where you want the second column to align.

GRAPHIC TABS

1. Type some text and insert tabs before the text that needs to be aligned. For the moment, the tabs act like carriage returns, pushing the ensuing text to the next line. 2. When you draw a vertical line, select it with the text block, and choose Make Text Wrap. The vertical line acts like a tab stop. 3. You can change the shape of the graphic tab stop. Here an anchor point was inserted and dragged over. 4. All paths act like they're closed for the sake of text wrap, so you have to choose shapes carefully.



3. Go back to the pointer tool to select both the line and the text block (by shift-clicking or by dragging a selection rectangle with the selection tool), and choose Make Text Wrap from the Type menu. The text after the tabs now aligns with the vertical line you drew.

You can also use irregular shapes instead of a simple vertical line. You can create an angled line, for instance, or even a bezier curve. Be aware, however, that for the purposes of text wrap, all Illustrator shapes act as closed objects. So the text will wrap to the edge of the closed shape even if you didn't actually close it.

Downloadable Fonts in EPS Files

When you save an Illustrator EPS file that uses many downloadable fonts, and then place the EPS file in Page-Maker or QuarkXPress, you often run into printing problems because these programs can't manage printer-font memory within EPS files. To solve the problem, use the Create Outlines command (Type menu) to convert the text in the document to paths.

Since this method removes any calls for downloadable fonts from the

EPS file, the page-layout program doesn't have to deal with printer-font memory. One caveat: type converted to outlines can make for some large and complex paths—sometimes beyond the ability of a PostScript device to handle—so make sure to check Split Long Paths on the Save/Print option in the Preferences dialog box and type the imagesetter's final output resolution into the Output Resolution text-edit box. As you should always do when splitting paths, create a backup copy of the document before you print or save.

Start-Up Files that Work

Adobe makes clear in its manuals that you can create a file called Adobe Illustrator Startup, which contains all your favorite fonts, patterns, colors, and the like, and all those goodies will be loaded whenever you start up Illustrator. This is great because adding a bunch of fonts to the menu, one at a time, is the most troublesome thing about Illustrator. What the manuals don't make clear is that you have to actually use an example of each font, pattern, or color in the Adobe Illustrator Startup file. You

**Next1 should leif him how he aught to love his own country and his own people, not houling them too much in bonding! A to much in bonding! A to make himself in the himself own should be a series of the same of the walls not yet in loo great a liberty, lest he be despleed, from

he ought to love his own people, not holding them too much in boncking, lest he make him selffers, exception which come selffers, conspiracled, and a thousand other work; nor yet his by all the selffers, conspirate at liberty, lest he by

GRAPHIC STANDOFF Adjust the left or right indents of a text block to modify the standoff of a text wrap.

can't just add it to the menu and expect Illustrator to remember it. So when you go through the trouble of adding all your fonts, remember to format at least one character using each font, then save the Adobe Illustrator Startup file.

The Graphic Standoff

When you wrap text around an object, Illustrator doesn't seem to have an easy way to set the text-wrap standoff from that object. But it's actually pretty simple to set the left and right standoffs. Click in the text block that you want to adjust, and set the left or right indent in the Type Style dialog box. You get this dialog box by choosing Style under the Type menu item (see "Graphic Standoff").

Rotating Angles

When you work with rotated objects, it's often difficult to get Illustrator's tools to work with you. With a rectangle that's rotated 33 degrees, for instance, horizontal and vertical scaling can make for some mean trigonometry. To solve this problem, change the Constrain angle in the Preferences dialog box to match the angle of the rotated object. The Constrain angle affects your shiftconstrained mouse movements and the orientation of the horizontal and vertical axes in the Transformation dialog boxes-most important, the scaling and skewing dialog boxes.

Now, with your Constrain angle set to 33 degrees (or whatever value you've chosen), it's a piece of cake to scale that rectangle "horizontally" or "vertically."

Contributing editor Steve Roth is coauthor of Real World PageMaker 4: Industrial Strength Techniques (Bantam, 1990).

THE YELLOW PAGES FOR MAC DEVELOPERS

Until now, it's been difficult to track down qualified, talented resources to develop Macintosh software. But now you can quickly find them in one

convenient place.

The Macintosh®

Development

Services Directory™

is the first sourcebook that will help
you design, program,
test and sell software
successfully. And cut
your development time
dramatically.

You'll discover the right people to supplement your in-house staff. Develop customized applications. Create interactive,

multimedia presentations. Help you market your product overseas. And much more.

The latest edition is available now, direct from the publisher, for only \$29.95.* To order, call toll-free

toll-free. 1-800-927-1100

Ext. 400

Detailed, cross-indexed profiles of nearly 1000 Macintosh resources, including contract programmers, testers, trainers, technical writers and more.



MZ Group 221 Main Street San Francisco, CA 94105

*Plus \$6.50 shipping& handling. CA residents add sales tax. © 1991 MZ Group. Int'l orders: 916-677-7171.

Circle 223 on reader service card.

Yet Another Breakthrough From Virtus Corporation.

Our newest breakthrough is designed to win accolades from our customers just as Virtus WalkThrough™ won from the industry in 1990.

You remember Virtus WalkThrough—it's the 3-D drawing and visualization program that lets you walk through your ideas in real-time.

The one that lets you see your ideas in 3-D nearly as fast as they come to your mind.

The one that enables you to impress your clients with interactive presentations that clearly communicate your ideas.

Our newest breakthrough does all this for you too. You see our newest breakthrough is Virtus WalkThrough's new price. Just \$395.

To get your copy simply give us a call today at 919-467-9700.





Virtus Corporation · 117 Edinburgh South, Suite 204 · Cary, North Carolina 27511

aximong in a diagram of visual corporation.

Circle 219 on reader service card.

Memory From \$29 Drives From \$209



30 Day Money Back Guarantee

Capacity	Int	ernal	Ext	ernal	Mechanism
40MB	\$	209	\$	279	Sony
45MB	\$	219	\$	287	Fujitsu
52MB	\$	248	\$	299	Quantum
90MB	\$	329	\$	389	Fujitsu
100MB	\$	349	\$	409	Toshiba
105MB	\$	385	\$	445	Quantum
120MB	\$	399	\$	469	Connor
135MB	\$	409	\$	479	Fujitsu
170MB	\$	625	\$	678	Quantum
185MB	\$	589	\$	669	Fujitsu
200MB	\$	649	\$	729	Connor
210MB	\$	677	\$	758	Quantum

Aurora L	arge Capaci	ty Drives	
Capacity	Internal	External	Mechanism
357MB	\$1178	\$1278	Fujitsu
440MB	\$1149	\$1249	Seagate Wren
650MB	\$1479	\$1569	Seagate Wren
680MB	\$1469	\$1559	Fujitsu
1.2GB	\$2099	\$2199	Fujitsu
1.2GB	\$2119	\$2219	Seagate Wren
1 year warranty on la	arge capacity devices.		

Removable Drives			
Legend 45MB Syquest		Toshiba CD ROM	\$ 519
Sony Optical 650MB	\$2899	Manufacturer's warranty.	

EMAC Hard Drives					
Capacity	Model	External	Capacity	Model	External
170MB	Impact	\$ 887	335MB	Metro	\$1590
150MB Tape	Impact	\$ 650	670MB	Metro	\$2153
170MB	Metro	\$ 914	1.3GB DAT	Metro	\$1906
Manufacturer's w	varranty.				

II Microlaser	Printers	w/Appletalk	
PS17	\$1293	PS35	\$1590
XLPS17/XLPS35	CALL	Manufacturer's warranty.	

Accessories			
2400 Baud Modem	\$ 97	Ext. Full Height Kit	\$ 99
2400 MNP Modem	\$ 161	Ext. Half Height Kit	\$ 117
2400 V42 Modem	\$ 190	Internal Kit	\$ 21
9600 V42 Modem	\$ 438	External Terminator	\$ 8
Dove Fax	\$ 273	50/50 Cable	\$ 6
Dove Fax Plus	\$ 332	Syguest Cartridges	\$ 68
Sicos Cordless Mouse	\$ 87	Sicos Track Ball	\$ 75
Sicos Rchgble Mouse	\$ 99	Sicos Crdls Track Ball	\$ 119
Sicos Fancy Mouse	\$ 75	EMAC Track Ball	\$ 86

OUMANAO (51000
SIMMS from	5	29
SIMMS from	5 1	42
	SIMMS from	

Micronet Technology Hard Drives		
Capacity	Туре	External
40MB	Zero Foot Print	\$ 475
40MB	Transportable	\$ 430
45MB	Syquest Removable	\$ 613
90MB	Syquest Removable	\$1049
100MB	Zero Foot Print	\$ 520
100MB	Transportable	\$ 739
200MB	Zero Foot Print	\$1086
200MB	Transportable	\$1109
312MB	Full Height	\$1780
423MB	Full Height	\$1892
660MB	Full Height	\$2440
1GB	Full Height	\$3339
Manufacturer's warra	nty.	

Call about used and refurbished drives.

VISA and MasterCard accepted— no surcharge. \$50 minimum on all orders.

1-800-426-1591

Monday through Friday 9 am to 7 pm EST

All products come with a 30 day money back guarantee against defects. 15% Restocking charge on non defective, unauthorized returns, or refused shipments. Prices and specifications subject to change without notice. Product subject to availability. \$6.00 on all C.O.D. Orders; Credit Card reference is required. International inquiries welcome.

AURORA INDUSTRIES, INC. • 60 Skiff Street, Suite 1011, Hamden, CT 06517-1017 • Inquiries 203-624-9018 • FAX-203-562-8191



WHERE TO BUY

A Guide to Products Featured in This Issue

This listing provides companies and phone numbers for products mentioned in this issue.

16" Trinitren Display; 19" Dual Mode Trinitron Display; 19" SuperMatch Color Display; 21" SuperMatch Two-Page Color Display SuperMac Technology; 408/245-2202; fax 408/735-7250. 20" Trinitren 8-Bit Color Monitor Ehman; 307/789-3830, 800/257-1666; fax 307/789-4656. **4Cast Digital Color Printer** Du Pont Printing and Publishing; 800/955-6555. 4th Dimension ACIUS: 408/252-4444: fax 408/252-0831. **Adobe Expert Collection** Adobe Systems; 415/961-4400, 800/833-6687; fax 415/961-1158. Adobe Illustrator Adobe Systems; 415/961-4400, 800/833-6687; fax 415/961-1158. Asobe Photoshop Adobe Systems; 415/961-4400, 800/833-6687; fax 415/961-1158. Adobe Type Library Adobe Systems; 415/961-4400, 800/833-6687; fax 415/961-1158. Agfa Focus II GSE Scanner Agfa Compugraphic Division; 508/658-5600, 800/822-5524; fax 508/658-6285. Aldus Digital Darkroom Silicon Beach Software: 619/695-6956; fax 619/695-7902. Aldus PageMaker Aldus Corp.; 206/628-2320.

The American Heritage

Electronic Dictionary The

Writing Tools Group, a

subsidiary of Wordstar

International: 415/332-

8692, 800/543-3873. AppleColor High-Resolution RGB Monitor Apple Computer; 408/996-1010. Apple Macintosh 12" RGB Display Apple Computer; 408/996-1010. Apple Scanner Apple Computer; 408/996-1010. AVR 3000/6S Plus AVR; 408/434-1115, 800/544-6243; fax 408/434-0968. **Business Color System** RasterOps Corp.; 408/562-4200, 800/468-7600; fax 408/562-4065. Canon IX-30F Canon USA: 516/488-6700. 800/848-4123. CDA-431 Chinon America: 213/533-0274, 800/441-0222; fax 213/533-1727. ChromaVision CalComp; 800/696-3741. CM148M Hitachi America; 201/825-8000. ColorBoard 708+: ColorBoard **8LC; ColorBoard 8XLi** RasterOps Corp.; 408/562-4200, 800/468-7600; fax 408/562-4065. ColorMax 8/24 Display System Sigma Designs; 415/770-0100, 800/933-9945; fax 415/770-0110. ColorPage T16 E-Machines; 503/646-6699, 800/344-7274; fax 503/641-0946. Color Pivot Radius; 408/ 434-1010, 800/227-2795; fax 408/434-0127. ColorSnap 32+ Computer Friends; 503/626-2291, 800/547-3303; fax 503/643-5379. ColorStudio Letraset USA; 201/845-6100, 800/343-8973; fax 201/845-4708. **Cutting Edge 20" Trinitron 8-Bit**

Color Monitor Cutting

307/789-8516.

DAtabase Baseline

Edge; 307/789-0582; fax

Publishing; 901/682-9676, 800/926-9677; fax 901/682-9691. Designer/8 20" Color Display System Generation Systems; 408/734-2100, 800/325-5811; fax 408/734-4626. DesignStudio Letraset USA; 201/845-6100, 800/343-8973; fax 201/845-4708. Diamond Scan 14 Mitsubishi Electronics America; 213/515-3993. DirectColor/8 Radius; 408/ 434-1010, 800/227-2795; fax 408/434-0127. Double Helix Odesta Corp.; 708/498-5615, 800/323-5423. **DrawingCard 2-Page Display** System CalComp; 800/696-3741. Dynodex Portfolio Systems; 914/876-7743: fax 914/876-7747. Earl Weaver Baseball Electronic Arts; 415/571-7171, 800/245-4525; fax 415/570-5137. E.L.F. Armor Fairfield Engineering; 515/472-5551; fax 515/472-4359. E-Machines T19 E-Machines: 503/646-6699, 800/344-7274; fax 503/641-0946. E-Machines TX E-Machines; 503/646-6699, 800/344-7274; fax 503/641-0946. Expert Set Monotype Typography; 312/855-1440, 800/666-6897; fax 312/939-0378. File Force ACIUS; 408/252-4444; fax 408/252-0831. FileMaker Pro Claris Corp.; 408/727-8227. HexiTrace Tree Star; 408/371-8343; fax 408/371-8343. FontMonger Ares Software Corp.; 415/578-9090; fax

415/378-8999. FoxBase+/Mac Fox Software; 419/874-0162. FrameMaker Frame Technology; 408/433-3311, 800/843-7263; fax 408/433-1928. 6S/C Radius; 408/434-1010, 800/227-2795; fax 408/434-0127. 6\$ plus Xerox Imaging Systems; 617/864-4700, 800/248-6550; fax 617/864-4161. HP Scanlet IIc: HP Scanlet Plus Hewlett-Packard: 800/752-0900. HyperCard Claris Corp.; 408/727-8227. iDS ColorVue 14" Color Manitor iDS Systems; 408/ 752-2952, 800/733-0078. ImageStudio Letraset USA; 201/845-6100, 800/343-8973; fax 201/845-4708. Interleaf Publisher Interleaf; 617/577-9800. Iris 4012 Scitex America Corp.; 617/275-5150, 800/858-0489; fax 617/275-3430. ITC Benguiat Bitstream; 617/497-6222, 800/237-3335; fax 617/868-4732. LabView 2 National Instruments; 512/250-9119; fax 512/794-8411. LetraStudio Letraset USA; 201/845-6100, 800/343-8973; fax 201/845-4708. L-View Multi-Mode Sigma Designs; 415/770-0100, 800/933-9945; fax 415/770-0110. Macintosh Display Card 4 • 8; Macintosh Display Card 8-24 Apple Computer; 408/996-1010. Mac-to-Mac Caravelle Networks Corp.; 613/596-2802; fax 613/596-9659. **MagicView** MacProducts USA; 512/472-8881; fax

512/499-0888.

Mag-Not TYV; 415/961-1117. Masquerade Night Diamonds Software; 714/842-2492. MegaGraphics 2008/16" Color Display System; Mega-Graphics; 805/484-3799, 800/487-6342; fax 805/484-5870. MegaGraphics 2008/16" Color Display System (hi-res): Mena-Graphics 2008/19" Display System: MegaGraphics 3008 MegaGraphics; 805/484-3799, 800/487-6342; fax 805/484-5870. Mcde32 Connectix Corp.; 800/950-5880; fax 415/324-2958. Multi-Sync 3D NEC Technologies; 508/264-8000, 800/632-4636. M.Y.O.B. Teleware; 201/ 586-2200, 800/322-6962: fax 201/586-2200. NumberMaze Decimals & Fractions Great Wave Software; 408/438-1990; fax 408/438-7171. Nutmeg 19C Nutmeg Systems; 203/966-3226, 800/777-8439; fax 203/966-7972. Consis 5 Blyth Software; 415/571-0222, 800/843-8615. Optima Connectix Corp.; 800/950-5880; fax 415/324-2958. **Oracle for the Macintosh** Oracle Corp.; 415/506-4176, 800/345-3267. The Oregon Trail MECC; 612/481-3500. Panerama ProVue Development Corp.; 714/892-8199; fax 714/893-4899. PassProof Kensington Microware; 415/572-2700, 800/535-4242; fax

415/572-9675.

(continues)



PCPC: 813/884-3092. 800/622-2888; fax 813/886-0520.

PC Scan 3000 Dest Corp.; 408/436-2700.

PC-VCR NEC Technologies: 508/264-8000. 800/632-4636.

Pentax IQ Scan Pentax: 303/460-1600; fax 303/460-1628

Personal Scan 200 Dest Corp.; 408/436-2700.

Phovos 600GS Prime Option; 213/618-0274, 800/282-9877; fax 213/618-1982.

PLI CD-ROM PLI; 415/657-2211, 800/288-8754.

ProView/8 Mirror Technologies; 612/633-

4450, 800/654-5294; fax 612/633-3136.

PSI Omega Rip Screen USA; 708/870-1960.

Publish-It Easy Timeworks: 708/559-1300; fax 708/559-1399.

QuarkXPress Quark; 303/

934-2211, 800/356-9363; fax 303/377-6327.

QuickDex Casady & Greene; 408/484-9228, 800/359-4920; fax 408/484-9218.

QuickImage 24 Mass Microsystems; 408/522-1200, 800/522-7979; fax 408/733-5499.

QuickView E-Machines; 503/646-6699, 800/344-7274; fax 503/641-0946.

Radius Color Display Radius; 408/434-1010, 800/227-2795; fax 408/434-0127.

Radius Color Display/21 Radius; 408/434-1010, 800/227-2795; fax

408/434-0127. RasterOps 8LC System RasterOps Corp.; 408/562-4200, 800/468-7600; fax

408/562-4065. RasterOps 8XLi System RasterOps Corp.; 408/562-4200, 800/468-7600; fax 408/562-4065.

Scan 300/GS Abaton, a

Subsidiary of Everex Systems; 415/683-2226, 800/444-5321; fax

415/683-2151. Scan 300/S Abaton, a Subsidiary of Everex Systems; 415/683-2226, 800/444-5321: fax 415/683-2151.

ScanMaker 600GS

Microtek; 213/321-2121, 800/654-4160; fax 213/538-1193.

ScanMaker 600ZS

Microtek: 213/321-2121. 800/654-4160; fax 213/538-1193.

ScriptMaster Linotype-Hell Company; 516/434-2000, 800/842-9721.

Silverscanner La Cie; 503/ 691-0771, 800/999-0143. SmarTwo Scitex America Corp.; 617/275-5150, 800/858-0489; fax 617/275-3430.

Spectrum/8 • 24 PDQ

SuperMac Technology; 408/245-2202; fax 408/735-7250.

Spectrum/8 Series III

SuperMac Technology; 408/245-2202; fax 408/735-7250.

Spectrum/8 si SuperMac Technology; 408/245-2202; fax 408/735-7250. Sprint 110 Optrotech Graphic Arts; 508/667-6037; fax 508/667-0953. StudioLink Du Pont

Printing and Publishing; 800/955-6555. ThunderScan Plus

Thunderware; 415/254-6581, 800/628-0693; fax 415/254-3047.

ThunderWorks Thunderware; 415/254-6581, 800/628-0693; fax 415/254-3047.

TopDown Kaetron Software Corp.; 713/890-3434.

TypeStyler Brøderbund Software; 415/492-3200, 800/521-6263.

17-3 Truvel, Division of Vidar Systems Corp.; 703/742-9500; fax

703/471-1165.

UG80 Grayscale Scanner Umax Technologies; 408/982-0771,

800/562-0311; fax 408/982-0776.

Ultra 1400 Princeton Graphic Systems; 404/664-1010. 800/221-1490.

V.I.P. Scitex America Corp.; 617/275-5150, 800/858-0489; fax 617/275-3430.

Wagon Train 1848 MECC; 612/481-3500. M

Public domain software, freeware, and shareware are available through online information services; user groups (call 800/538-9696 ext. 500 for information on a local user group); or mail-order clearinghouses such as EDUCORP (800/843-9497, 619/536-9999) or the Public Domain Exchange (800/331-8125, 408/496-0624 in California).



Build Your Own Mac System

10/4/91

order to receive 1%

Classic 1Mb	\$ 849
LC 2/40	\$1749
SI 3/40	\$2649
CI 5Mb	53489
FX 4Mb	5498

Hard Drives

40 MD	1/3
105 MbS	495
170 MbS	699
210 MbS	875
330 MbS	1475

Dove 030 16Mhz	\$53
2nd Wave NB4	\$103
Nu Bus Adaptor	\$18
SI Processor direct	\$18
Dactor VI Accolorator	. 622

MacPro Plus	S125
Datadesk 101	
Apple Ex	
Apple Standard	\$ 90
Switchboard	

Zoom 2400 baud	S 9
Anchor 9600 baud	
Abaton Interfax	\$38
Orchid Fax	
Shiva Net V.32	

INTERNAL	
256K SimmS	4
512K Simm\$	10
1Mb. SimmS	4
1Mb. FX SimmS	50
2Mb. SimmS.	99
4 Mb. Simm\$	179
4 Mb. FX SimmS	189
Classic RAM S	149

video Caras		
LC VRAM	\$149	
Apple 4.8 card	S459	
Raster 24STV		
Raster 24Si	\$689	
Raster 24 S	\$529	
Raster 364	\$999	
Micro 8Bit SE30		
Dadine	Call	

\$565
\$685
\$475
\$485
\$415
\$1879
S375
\$699

A Little 3	
QMS PS 410\$1	899
Style WriterS	
DeskwriterS	489
TI PS17S	235
TI PS35S	1535
NEC SW II M.90S1	575
Imagewriter II S	
Apple Persnl LW/LS S	925

ı	
ĺ	Microtek 600Zs\$14
١	Micron Cache \$ 29
	Turbo Ball\$ 1
	Phone Net con\$
l	Asante EthernetS 39
ı	Toshiba CD ROM\$ 7.
	PLI Infinity 88R\$129
	PLI 88R Cart \$ 1

Day Star Epson

Raster Ops

Radius

TI Wang

Asante Abaton

Sony

If it's not listed, call us, we probably have it. We'll match /beat any price!

8711 Burnet Road, Building E-56 Austin, Texas 78758 (512) 454-4739 FAX: (512) 454-0980 (800) 622-7123 All Prices subject to change.

LaserMax

DataProducts

Terms: We accept Visa, MasterCard, and Discover & AmEx. Orders prepaid by Cashier's Check may deduct 1% from above prices. Returns may be subject to restocking fee. Shipping not included. All returns must be in origanil Packing.

Hardware Express • 1-800-622-7123 • 1-800-MAC-S123

Circle 87 on reader service card.

BILLBOARI

Can You Identify This Computer?

This used to be a compact Macintosh (PLUS, SE, SE/30) with the small 9" screen! Now it's a MicroMac!

A slimline, modular computer with your choice of a crisp half, full or dual page display, an internal hard disk and additional expansion capabilities.

Upgrade your existing Macintosh in less than one hour to obtain these benefits:

- Get second SE expansion slot for accelerator or network card with ZeroSlot video card for MicroMac SE
- Run Virtual Memory under SYSTEM 7 with 68030 based accelerator upgrade
- Store up to 120MB on fast internal hard disk drive even for MicroMac PLUS
- Save desktop space with small footprint beadless Macintosh
- Design color graphis with 8-bit or 24-bit color option for MicroMac SE/30
- · Increase productivity when working with large documents or spreadsheets by using large monitor

Circle 92 on reader service card

The MicroMac Upgrade System comes complete with display, video card, fan-cooled power supply, cables, MicroMac PLUS with full page display \$995; MicroMac SE with dual page display \$1295; MicroMac SE/30 with 8-bit color \$875 (color monitor optional);

Trade in your existing Macintosh case. Exchange your present hard disk.

Price

Examples:

Call today for complete information package! MicroMac Technology 9 Sorbonne, Laguna Niguel, CA 92677, USA Phone: (714) 363-9915 FAX: (714) 363-0755



MicroMac Upgrade System, shown here with full page display, repackages your existing small screen Macintosh into a modular system.

MWBILLBOARD



You run a thriving business built upon the underlying philosophy of sharing information. When it came to buying software, you listened to the computer industry's recommendations to buy individual packages. Now you have them and they don't work together. In fact, your office network isn't sharing anything but eMail. Productivity is declining along with your image to your customers.

A4™ is truly integrated, working seamlessly toward one philosophy - sharing.

A4 is available Single User or Multiuser and includes AR, AP, GL, PR Links, Order Entry, Invoicing, Quotes, Inventory, Purchase Orders, User Defined Sales and Financial Reports, Word Processing, Contacts, Sales Lead Tracking, Calendar & Memos.

\$1,295 - Single User \$1,595 - Multiuser A4 is \$795 - GL/Contacts Open source code in 4th Dimension®, training in Telluride and custom design available.

A full function demo is available for \$30.



Softek Design, Inc.

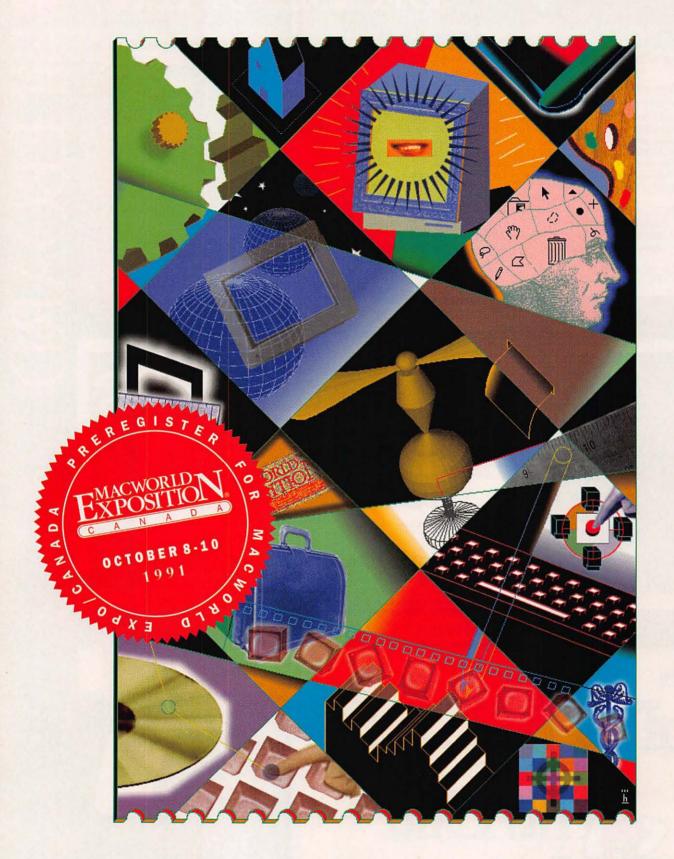
P.O. Box 2100, Telluride CO 81435, (303) 728-5252 FAX (303) 728-6767

Circle 196 on reader service card

MWBILLBOARD

reat Mac Buys Roll out your product Call Niki Stranz at 1.800.888.8622

MWBILLBOARD



Your ticket to

Preregister now for MACWORLD Expo/Canada and get \$10 to \$15 off your ticket price.

The largest Macintosh event in Canada will be in Toronto Tuesday, October 8 through Thursday, October 10, 1991, at the Canadian National Exhibition Place in the

Better Living Centre and
Trillium Theatre. This
year's MACWORLD
Expo/Canada will fill
you with information
on the latest hardware, software,
peripherals and
services. It will
thrill you with innovations that make the

Macintosh easier to use. It will stir your imagination with new ways to put your Mac to work. And that's not all. Return the attached preregistration card with your payment by September \$\infty\$ 13, and you'll receive incredible savings — \$15 off all Conference Sessions* and Exhibits, for only \$70 US/\$80 CDN (\$85 US/\$95 CDN cash at the door) or \$10 or more off Exhibits—only admission, for only \$15 US/\$18 CDN (\$25 US/\$30 CDN cash at the door).**

When you preregister, you'll save time and money. We'll send your admission badge early, so you can walk right into MACWORLD Expo, right past the long lines at the door. With thousands of people expected to attend this world-class event, preregister now and maximize your time on-line at the exhibits, not in line.

If you go to only one computer show this year, make it MACWORLD Expo. Whether your Mac is in your office, studio, home, lab or classroom, you'll find something new at MACWORLD Expo. And if you don't have a Mac yet, come and see what you've been missing from the more than 150 companies exhibiting in over 100,000 square feet. Networking. Spreadsheet analysis. Databases. Education. Research. Word processing. Accounting. Law. CAD/CAM. Forecasting. Design. Publishing. Illustration. Animation. Music. Programming. Entertainment. You'll see it all.

A selection of nine different topic areas.

At MACWORLD Expo/Canada, choose from conference sessions in nine different topic areas. You'll learn the latest from industry insiders. And to start the conference on Tuesday, we're featuring a 2-hour spectacular session on System 7.0, where you'll discover the fine points of Apple's newest and greatest operating system.

System 7.0 Survival Guide.

Demonstrations and insightful
discussions on the features and fine
points of
Apple's newest
operating sys-

tem, along with a real-world report of the opportunities and

obstacles 7.0 is creating.

The Multimedia Mac. Dazzling developments surrounding the exciting integration of video, sound, graphics and animation.

MACWORLD Expo Show Hours

Exhibits and Conference Programs

Tuesday, October 8 12 p.m. to 8 p.m.

Wednesday, October 9 10 a.m. to 6 p.m.

Thursday, October 10 10 a.m. to 6 p.m.

information, innovation

Hotels



THE WESTIN HARBOUR CASTLE

Harbour Castle

Westin

1 Harbour

Square

Toronto
(416) 869-1600

\$130 CDN

Holiday Inn on King 370 King Street West Toronto (416) 599-4000 \$110 CDN



955 Bay Street Toronto (800) 268-3790 \$140 CDN

Rooms are priced for single and double occupancy.

The Designer Mac. The latest trends and tips for graphic artists, ad agencies, architects and engineers.

The Business Mac. Solid advice and case studies for corporate, small business, legal and health care users.

Mac Programmer/ Developer
Forum. The place for novice and
veteran techies to meet, learn and
brainstorm.

How to Get Started
Sessions. A brandnew conference for
those who are
brand-new to the
Mac. Especially useful to new Mac
Classic and LC owners!

Advanced User Workshops.

Experts share their expertise to reveal hot new ideas and insider's tricks on the Mac.

Special Interest Group Meetings. For those who are continually seeking new ways to prosper and profit from the Mac, including The Mac in Education.

Late-Breaking/Popular Demand Topics. Special requests, the newest market developments, and the everpopular MACWORLD Expo User Group Extravaganza (MUSE).

UGWUMP (User Group Welcoming/Unwinding/Meeting Place). "People networking," provided with MACWORLD Expo's compliments. Discover user groups worldwide, share success stories, exchange newsletters and literature, learn how to start a user group in your area, and more!

Save 15% to 40% when you fly Air Canada.

MACWORLD Expo makes it possible to save money getting to and around Toronto. Air Canada will automatically discount your fare from 15% to 40% when you call 1-800-361-7585 and ask for Event #917131.

Reduced rates for hotels and cars.

What's more, you'll get a reduced rate when you book your reservation directly at one of the hotels listed here. Just mention you're coming to MACWORLD Expo. But hurry, space is limited.

And if you plan to rent a car, you'll receive a great rate from Avis when you tell the reservations operator that you're a MACWORLD Expo attendee. Just call 1-800-331-1600 and ask for the Worldwide Discount # B136000.

Don't miss out on incredible preregistration savings.

The deadline to receive your preregistration discounts of \$10 to \$15 is fast approaching. So fill out the attached form today and send it in with your payment (check or cre

today and send it in with your payment (check or credit card). And if the form is missing from this ad, or if you have any other questions, just call the prerecorded MACWORLD Expo information hotline at (617) 361-3941.

Macworld Expo. For all that's new in the world of Macintosh, it's just the ticket.



Use this ticket to preregister for MACWORLD Expo/Canada by September 6 13 and save \$10 to \$15.

Please choose your package and fill out the form completely. Incomplete forms will be returned. Use one form per person; make photocopies to register additional people. Do not staple check to form. Send completed forms to:

MACWORLD Expo/Canada P.O. Box 4010 Dedham, MA 02026

Registration forms received after September \$\mathbeloau\$ 13 will be returned. No purchase orders accepted. Registration fees are nonrefundable.

U.S. and Canadian Attendees

Your badge will be mailed to you on or about September 20. Check box indicating where badge should be sent. All other



badges will be held at the Preregistration Counter at the Better Living Centre for pick up beginning Monday, October 7.

			20
Please register me for: Package One \$70 US/\$80 CDN** Conference sessions* and exhibits. Preregister by September 6 13. (Cash only at the door: \$85 US/\$95 CDN**.)	☐ Package Two \$15 US/\$18 CDN** Admission to exhibits only. Preregister by September 613. (Cash only at the doc \$25 US/\$30 CDN**.)	or:	
Please send my registration badge and for	urther information to:		He Haro
Please check one: □ Home Address □ Compan	y Address		Les Livery
Last Name///////	_/// First Name		
Street Address/////			
City _/_/_/_/_/_/_/			
Country(If other than U.S.)/_/_//_			
If mailing to company address:			
Title///////			
Company//////		111111	11111
Check enclosed (make payable to MACWORLE			
	Amount S		
			1-4-2011
Account Number/_/_/_/_/_/			
Expiration Date (include all numbers)//			
Card Holder Signature (Signature necessary to be	valid)		
If card holder is other than registrant, please prin	t cardholder's name below:		
Last Name//////	/ / First Name / / / /	11111	1 1
Cash only at the door. After September 6 13			
Cash only at the door. After September 9 15	, you must register at the show.		THE PARTY OF THE P
Please check the appropriate information	n:		
The state of the s	our Title	Size of Your Organization	A STATE OF THE PARTY OF THE PAR
	6. CEO/president/owner	ees national and interna	
	7. DP/MIS manager	28. Under 50	31. 🗆 500-999
	8. □ Manager/department head 9. □ Network manager	29. 🗆 50-99	32. 1,000-5,000
	0. ☐ Programmer/analyst	30. 🗆 100-499	33. Over 5,000
	1. ☐ Engineer/research & development		
	2. Consultant	Which personal comput	ter(s) do vou own/use?
	3. Marketing/sales	34. Macintosh Classic	41. Macintosh Ilci
	4. D Educator	35. Macintosh Plus	42. Macintosh IIfx
	5. Art director/graphics	36. Macintosh SE	43. Apple II Series
	6. 🗆 Editor/writer	37. Macintosh II	44. IBM PC (or clone)
12. Utilities 2	7. 🗆 Other (specify)	38. Macintosh	45. None
13. Engineering		39. Macintosh LC	46. Other (specify)
14. Health services		40. Macintosh IIsi	
15. Other (specify)			

*All conference sessions are on a first-come, first-served basis with no guaranteed seating.

**All admissions fees include 7% GST. MACWORLD Expo is sponsored by Macworld, the Macintosh™ Magazine, an IDG Communications publication. MACWORLD Exposition is an independent trade show produced by World Expo Corporation, managed by Mitch Hall Associates and International Conferences and Exhibitions, and not affiliated with Apple Computer, Inc. MAC and MACINTOSH are trademarks of Apple Computer, Inc. World Expo is an IDG company, the world's leader in information services on information technology.

MacSource Has Lower Macintosh System Prices

Mac IIfx System

Macintosh IIfx, 4mb RAM, 105mb HD, 1.44mb Apple FDHD, Mouse, Standard Keyboard, 14" Color Monitor, Relax 8 Bit Color Card.

System 7.0 Included. Only ... \$6,220

...add \$270 With 24 bit Color With Seiko CM-1445 ...add \$265

Mac IIci System

Macintosh IIci, 5mb RAM, 105mb HD, 1.44mb Apple FDHD, Mouse, Standard Keyboard, 14" Color Monitor, 8 Bit Color.

System 7.0 Included. Only ... \$4,465

With 24 bit Color ...add \$539 With Seiko CM-1445 ...add \$265

Mac LC System

Macintosh LC, 4mb RAM, 80mb Hard Drive, 1.44mb Apple FDHD, Mouse, Apple Standard Keyboard, 12" Apple Color Monitor.

Only ... \$2,699

With 14" Trinitron ...add \$175

Mac Classic SALE!

Macintosh Classic, 2mb RAM, 40mb Hard Drive, 1.44mb Apple FDHD, Mouse.

Only ... \$1,199 with 105mb HD ...\$1,599

Mac IIsi Special

Macintosh IIsi, 5mb RAM, 105mb Hard Drive, 1.44mb Apple FDHD, Mouse, Standard Keyboard, 14" Color Monitor, 8 Bit Color.

Display Solutions



Seiko CM1445 \$589 \$1949 Ikegami 20" Trinitron Ikegami 8bit Bundle \$2499 \$3499 Ikegami 24bit Bundle Goldstar 1450 Plus \$349 \$485 Magnavox Professional MicroTek 14" MCD-1404 \$655 MicroTek 14" MCD-1403 \$749 NEC 3DS 14" Monitor \$685 8bit 19" Card \$489 24bit 19" Card \$1669 E-Machines Monitors Call Sigma Designs Monitors Call

RasterOps RasterOps 19" Mono ClearVue 19" GS

\$1299 \$1599 19" 24L System \$5499 19" 8L System \$4159 RasterOps 24s \$539 RasterOps 24si \$739 RasterOps 24stv \$1189 RasterOps 24xltv \$3339 \$599 RasterOps 264/SE30 \$480 Video Expander RasterOps 364 call All Other RasterOps call

Radius

Itauius	
Radius Pivot-SI/CI	\$769
Radius Pivot (with card)	\$979
Radius Portrait - SI/CI	\$625
Radius Portrait (with card)	\$869
Radius Color Pivot	\$1399
Radius Color Pivot Interface	\$549
Radius 19" TPD	\$1399
Radius 19" TPD/GS	\$1685
Radius 21" Color Display	\$3096
8 bit interface for above	\$1265
24 bit interface for above	\$2395
Radius Direct Color/GX	\$560
Radius Rocket	\$2415

Printers



TI MicroLaser PS/35 TI MicroLaser PS/17 \$1335 \$2895 TI MicroLaser 35XL NEC SilentWriter IIM90 \$1615 Crystal Print Publisher II \$2299 QMS PS-410 \$1989 Apple LaserWriter IInt \$2759 LaserWriter IIntx \$3445 Apple StyleWriter \$435



HyperNet Phone Net Connectors Only \$25 Each 10 Pack Only \$159



Hewlett-Packard

HP DeskWriter \$509 HPLaserJet IIP \$1459 HP LaserJet IIIP \$1929



ZOOM V.42 bis Modem Includes all cables, Software and Documentation Only \$189 ZOOM 2400 Modem

Hard Drives

IDS 45 Removable Drive IDS Clipper 20mb MacinStor Mac 100-ZFP External \$729 \$3560 Mac 1 GigaByte External Mac 325S1b External 325mb \$1795 Mac 650mb External \$2670 MCE1 Erasable Optical \$4995 1 Gigabyte Subsystem .. 35ms

300 meg External \$1859 Infinity 44mb Removable \$699 Infinity 88mb Removable \$1299 Generic

Syquest 44mb Removable \$525 Syquest 88mb Removable \$995 Maxtor 660mb Drive \$1789

Scanners

MicroTek 600zs Scanner \$1459 MicroTek 600gs Scarner \$1099 \$289 Logitech ScanMan DataCopy GS Plus \$1395

Wacom Tablets

Wacom 6x9 \$509 Wacom 12x12 \$759 \$1099 Wacom 12x17 Wacom 15x15 \$1099 Wacom 18x25 \$2949

Input Devices



Keytronic MacPro Plus \$125 \$149 DataDesk SwitchBoard DataDesk Mac101E \$125 Kensington Turbo Mouse \$110 Silouette Trackball \$80

Mac Classic Add-On



Mac CLassic 16mhz Accelerator



Our Friendly, Knowlegeable Sales Staff Wants To Make It Easy For You. Call Us, Were Waiting...

-800-685-2622 Free Technical Support 1-800-723-2622

We Accept Visa and MasterCard with No Surcharge. Customers may deduct 1% for prepayment by Cashier's Check. Restocking fee on products purchased in error. Product availability may be limited. Prices Subject to Change without Notice. To Order or For Information call us toll free.

800-685-2622

7801 North Lamar, Suite E-190 Austin, Texas 78752 (512) 467-9652 • FAX (512) 467-2642

Mac IIsi Color System

Only...\$3560







· All 3.5" Drives are available in zero footprint (including a 40watt power supply, and dual AC outlets), or micro cabinets

 All 5,25" Drives are available in zero footprint external (including a 65 watt power supply, cables, and ext. terminators) or asinternals for the Mac II, IIx, and IIfx.

Fuiitsu 3.5" Drives

		Internal	External
45 MB	3.5" Low Profile/Low Power3yr warr, 50,000MTBF	\$238	\$298
90 MB	3.5"3yr warr, 50,000 MTBF	\$338	\$398
135 MB	3.5"3yr warr, 50,000 MTBF		\$498
185 MB	3.5"3yr warr, 50,000 MTBF		\$598
330 MB	3.5" 5 yr warr., 200,000 MTBf*, 9ms Access		
425 MB	3.5" 5 yr warr., 200,000 MTB1* 9ms Access		
520 MB	3.5" 5 yr warr., 200,000 MTBf* 9ms Access		
	upon Folluro in the guergen life expectancy of a drive / in case of a 200 000 MOTE, this makes a potential of 2		

Fujitsu 5.25" Drives

External

	5 Year Warranty: 200,000 Hours WIBF!		
45 MB	3.5" Low Profile/Low Power3yr warr, 50,000MTBF	Internal \$238	External \$298
357 MB	5.25" Full Hght 16ms	\$1198	
680 MB	5.25" Full Hght 16ms	\$1498	\$1598
1.2 Gig	5.25" Full Hght 14ms	\$2498	\$2598
 Mean Time Be 	tween Failure is the average life expectancy of a drive. 24 hour factory replacement available for 5.25° of	frives for additional fee.	

Archive DAT Tape Backup

2.2 Gig Capability.....

- Up to 10 mb per minute backup time
- Includes SoftBackup II for Fast network and unattended backup capabilities

SvQuest! 44MB & 88MB Removables

\$1498 44MB REMOVABLE \$448.00 88MB REMOVABLE \$848.00

- 19ms Access time
- Both Drives include Cartridge
- Dual AC Outlets, 40 Watt power supply SCSI Select and 2 Year Warranty

Ricoh Optical

as well as internal for all Mac's.

600 MB Optical..... \$2698

- Read/write reliable storage
- 66ms Access Time
- Great for archiving, color scans etc.

Fujitsu 1.2 Gig Drive

- 11.5 M.S. access time / 4.8 mbs transfer rate
- 200,000 hours mean time between failure
- 5 year warranty
- Incredibly fast! MacWorlds Fastest 1.2Gig!

800 K Floppy Drive \$99 JX-9500PS Sharp Printer 35 Fonts

\$2498 \$2598

Internal

JX-9500PS 35 Fonts..... \$1648.00

- 2.5 mb Ram Memory
- MacUser #1 printer 4.5 mice rating
- 35 Fonts, 6 page per minute
- Letter, legal and transperancies
- Includes Appletalk interface!
- Sharp is the manufacturer of the TI Microlaser. this is the same printer!

These Fuiitsu External floppy drives have a one year warranty. Completely compatible. These are brand new slimline drives

and they look great! These drives retail for \$259!

Fujitsu 800k \$99.00!

Quantum Drives/Wren Drives

	Internal	Externa
Q 52 MB 3.5" LPS	\$278	\$348
Q 105 MB 3.5"LPS	\$448	\$498
Q 120 MB 3.5"	\$598	\$658
Q 170 MB 3.5"	\$688	\$758
Q 210 MB 3.5"	\$778	\$848
Wren 337 MB RUNNER	THE RESERVE OF THE PARTY OF THE	THE RESERVE OF THE PARTY OF THE
Wren 600 MB F/H	\$1598	\$1698
Wren 630 MB RUNNER II	Control of the Contro	and the second
Wren 1.2 Gig	\$2298	\$2398

19" Color Monitors!

19" Ikegami Color System.	8 Bit	\$1098
DM-2060		
19" Trinitron Color System		\$2398
Ikegami CT-20	24Bit	\$3198
19" Sony Color System	8 Bit	\$2398
Sony GDM 1954	24Bit	\$3198

All moniter systems include interface board and cable.



800-621-8467



60 East Chestnut - 145, Chicago, IL 60611 Visa, Mastercard, Amex, COD, Telecheck Approved Checks, Gov., Corp., Univ., P.O.s welcome All new Drives, Preformatted with latest stable system software, Factory warranty, / Bracket, cables and software included/30 Day Money back Guarantee on all drive products.

Hours: 8:30 - 7:00 CST, Saturdays 10:00 - 4:00 Technical Service and Order Tracking call: 312-664-8225

Quantum 210mb\$699



High performance drives available in internal configurations for most Macs

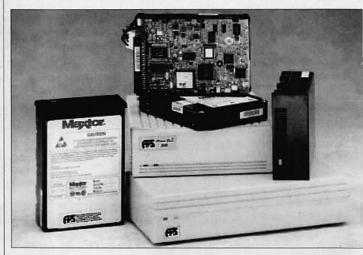
MB	INTL	EXTL
52	\$249	\$339
105	399	489
120	579	669
170	599	689
210	699	799

For a limited time, with any drive purchase, you can buy Redux, Init Picker or Rival by Microseeds Publishing. Any one, \$20; any 2, \$33.95; all three, \$44.95. Retrospect Remote "10 Pack" available with tape drive purchase for \$129.00.

Maxtor 120^{mb \$}399

MB INTL EXTL 80 \$249 \$339 120 399 489

High speed drive selections available for al Mac II models, Classic, SE & SE/30



213 659 749 **340** 1099 1189 **535** 1599 1689 **760** 1649 1849 **1.2G** 2649 1849

Quality Economy Toll-free support 1- & 2-year warranties

VUURSI -based sub-systems

one cartridge addt'l cart.\$69-129



\$479 899 899 Dual 1699



\$579 Includes free "Nautilus" CD

-based sub-systems

one cass.& Retrospect Add'l cass. \$17-\$24

TEAC 155 \$599 600 899 WangDAT 1449 WangDAT 1999 **Python** 1499

TwP \$249 249 **Dub'l-Bus** 329

Order Ethernet 6pack and get 6-User QuickMail by CE Software -Free

\$1349

(Dub'l-Bus add \$75 ea.)



Sampo

30 Day Money Back Guarantee • All

• 30 Day Money Back Guarantee • All Drive products carry a 30 day Money-back guarantee. Your risk in the transaction is the cost of shipping.
• Disk for Disk Replacement Warranty • Quantum, Maxtor (excluding Panther 1.2G), Syquest and ARDAT Drives carry a two year "parts & labor" disk-for-disk replacement warranty. WREN, Teac, WangDAT, Conner drives and Syquest Cartridges carry a one year "parts & labor" disk-for-disk replacement warranty.
• Brackets and Cables Included • All Hard Drives include brackets, cables, cords and LED's required for operation in the specified Macintosh. All Hard Drives come preformatted with Apple's latest stable all-platform System software, 18.8 MB of ubdilly Distributable software from the

platform System software, 18.8 MB of Publicly Distributable software from the B'MUG Library, and the "ALLIANCE POWER TOOLS" SCSI formatter/hard partitioner. • 30 Day Performance Guarantee • If your drive fails to perform properly in the first 30 days and our technical support staff can't solve the problem over the phone, we'll ship you a replacement drive overnight and have you a replacement drive overnight and nave your suspect drive picked up at our expense. Offer is subject to some limitations. Products being returned for credit and international orders do not apply. • Toll-Free Technical Support • Toll Free Technical Support, 9:30am to 7pm Monday thru Friday, Central Time. As often or for as long as you need.

AMEX ACCEPTED GOV., UNIV., PO's, NO SURCHARGE







VISA/MC, DISCOVER NO SURCHARGE ACCEPTED CORP. PO's, NO SURCHARGE

Toll Free U.S. & Canada

M-F 8:30AM-7PM CT. SAT 10AM-4PM CT TOLL FREE UK: 0800-897-545. TOLL FREE AUSTRALIA: 0014-800-125-875 INTERNATIONAL: 1-816 478-8300 FAX: 1-816 478-4596 (24 HRS) Circle 15 on reader service card



40B-40C IBM/PS-2 248

232 IDG Books

9 Intuit

94 Image Club

227 -

170 In Focus Systems, Inc. 5 800/327-7231

60 Inline Design 111 203/364-0063

185 Intelligent Resources 135 708/705-9388

- 403/262-8008

- 800/624-8742

SAY YOU SAW IT IN MACWORLD.

To purchase products advertised in this issue call the phone numbers below or use the reader service number for ourFastFacts Product Information Card located on the next page



Page		eader		Page		Reader		Page	Advertions	Reader	Phone
No. F	Advertiser Svo	c. No.	. Phone	No. A	Advertiser S	Svc. No.	. Phone	No.	Advertiser	Svc. No	o. Phone
5	Abaton	43	800/444-5321	178-179	Iomega	260	800/777-6649	66	Postcraft Internation	onal	
	Advanced Vision	70	000/777 002	170	lottrogu		000/11.		Inc.	and the same of th	805/257-1797
	Research	47	800/54-IMAGE	208	James Burn			287			A CONTRACTOR OF THE PARTY OF TH
58	AEC Software	83	800/346-9413		International	107	800/431-4610	29			-
90	Aldus		000,040 0115	102	! Jasmine	126			T Of magrane.	TY	
200		35	214/680-2060		Kensington		000,011	208	Quantum Leap	82	800/762-2877
	Amtex					255/256	415-572-2700	181	The state of the s	295	
			800/325-3841	192D	Kensington		TACK NOTES AND A	100000	Carrie Management	10000	CUCIO
	A STATE OF THE STA			- Annual Control	Microware	180/181	1 415-572-2700	16-17	Radius	178	800/227-2795
	Applied Engineering	124	214-241-6060		Nilot Siles	100,	4.00.	40D			800/729-2656
246-247	APS	15		30-31	La Cie	197	800/999-0143		Reference Software		800/872-9933
	Aurora Industries	18			La Cie	52	800/999-0143		naturation community		000,0.2 2222
	Autora muddonos		000/420 .00.	61		195		38	Salient	39	415/321-5975
192B	Bimillennium Corp.	233	800/488-8662	69		- 155	612/944-9696		Secure-It	239	
	THE RESERVE OF THE PARTY OF THE	14		71		93	800/735-6442		Shiva Corp.		800/451-7592
					Logicode	30	800/133-0442		Softek Design	196	AND THE PROPERTY OF THE PROPER
	The state of the s	-	CONTRACTOR OF THE PROPERTY OF THE PARTY OF T	266	Man and Mara	95	000/8440-0052				
	Caere Corp.	1	800/535-SCAN	Property State (State (85	800/MAC-0052		SoftSync/BLOC		
	Calcomp	3		157-160	Section of the sectio	140	800/926-6221		Software Security		800/333-0407
34	Checkfree			245		140			Spectrum Holobyt		
010	Technologies		800/882-5280			70	800/248-0800		SPSS, Inc	210	800/45-STATS
	Claris	-	800/544-8554	72-79		_	800/248-0800		Supermac	88	-
		_		218-225		209			Supermac		
168-169			800/544-8554	441777		106		165	Symantec	154	800/441-7234
	Compuserve	319		0.000	MacCenter	182		1-	A STATE OF	ARTY	
	The state of the s	10	800/531-5236	44-53		-	800/334-4444		TBSP	25	800/755-8277
54				26		58	800/622-8804	269	Tass Optical World	d.	
	Cybernetics	188		199		109			Inc.	211	619/558-8882
288	CORE Int'I	215	i —	262-263	MacLand	264		192B	Teknosys	190	
	Curtis Manufacturing		THE RESERVE OF THE PARTY OF THE	258-259				200-201	Tektronix	143	
			/	268		171	The state of the s		TeleTypesetting	11	617/734-9700
80	DataViz	36	203/268-0030	Control of	2.0000000000000000000000000000000000000	48	800/367-2622		Teleware	76	800-322-MYO
64	Daystar Digital	201		28			800/722-6263		Texas Instruments		
27	Deneba Software	57	800/6CANVAS	255					Thirdwave	156	
187		6/337		104-113		240			Thunderware	222	
	5/	79		240-243					Tiger Software	139	
256-257		163	Control of the Contro	209			A HELLEN		Timeworks	206	
200 20.	Di. Iviac	100	600/023-0221		Systems, Inc.	207	800/522-7979		Truevision	38	
174	E-Machines	303	800/34GRAPH	183		20,	800/322-1313	40	Truevision	30	800/858-TRUE
	E-Machines			100	International	217	000/050 7506	225	Malus Corn	210	010/407 0700
		144		230	International Micromac		800/852-7526	230	Virtus Corp.	219	919/467-9700
						92	714/363-9915	00.07	***************************************		
253	Express Direct	184	800/535-3252	205	Micronet Technolo			36-37	Wordperfect		800/526-5034
400					Inc.	113				222	
190	Fifth Generation			100000000000000000000000000000000000000	Microsoft	-	800/541-1261	98	Xante	218	800/926-8839
	Systems		800/477-8212	1000000	Microsoft		800/541-1261				
	Fractal Design Corp.		408/688-8800		Microtech Int'l.		800/325-1895				
6-7	Frame Technology	60	800/U4FRAME		Microtek		800/654-4160				
100	manufacture of the second				Mirror Technologie	ies 243	800/633-4450	13	2 01	TD	OITT
	GDT Softworks	317	800/663-6222		MZ Group	223	4-0			II	OUT
216	Genstar Rental				A STATE OF THE STA		THE RESERVE TO SERVE	77/			
	Electronics	-	800/422-3300	40A	NEC Technologies	257	800/NEC-INFO	11) USE	PH	I()NF
39	Global Village	9	800/736-4821		NuDesign		_				
	Graphsoft	46			NewGen	244/2/	46714/641-8900		NUMI	RFI	26
	Graphics	10,000	001,10	2000	NoRad		800/624-8999		MATATI	JLI	
7.5				-	Ivunau	20-	000/024 0333	T	OD TI	TOTAL	TDT
	Hard Drives		THE RESERVE					-			, _
	Hard Drives International	_	900/776-DISK	205	OCH	374	200/645-0011	F	OR FU	UL	IKE
267	International	_ 87	800/776-DISK 800/622-7123		OCLI Orange Micro		800/545-0CLI				
267 238		87		192A	OCLI Orange Micro Outbound Systems	31	800/545-0CLI —		OK FU REFER		

59 PLI

192C Pacer Software

68 Paracomp

215 Pacific Data Products

167 Peachtree Software

86 Portfolio Systems

217 Pinnacle Micro

208

91 619/454-0565

- 619/597-4633

78 800/877-7749

100 800/247-3224

132 800/553-7070

54 800/SAY-DYNO

MACNIFICENT SAVINGS!

Get MACWORLD for just

per issue!

Please enter a subscription to MACWORLD in my name for the term indicated below:

BEST Dea	\$54.00 (\$1.50 per issue)
	2 years (24 issues)– \$39.97 (\$1.67 per issue)
GOOD Deal	

radille	_				-
Company			100	itte. u	8
	LE PA				

Address ______
City/State/Zip _____

☐ Please bill me. ☐ Payment enclosed. 4BCZØ

Allow 4 to 6 weeks for delivery. Basic subscription price is \$30 for 12 issues. The annual cover price is \$39 per issue, \$47.40 annually. For Mexican subscriptions, please add \$18 per year for shipping. For Canadian subscriptions, add \$18 per year plus 7% of subscription price (for Canadian GST). Add \$70 annually for all other foreign countries.

Subscribe <u>now</u> and SAVE \$\$\$!



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1167 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld Subscription Department P.O. Box 51666 Boulder, Colorado 80321-1666

Haldlerelledandentlelledandentlelled

NO POSTAGE UNITED STATES

JUST FOR YOU, FREE PRODUCT INFORMATION FROM MACWORLD.

There's no cost; no obligation. Simply fill out the form and circle the numbers on the card below for the products which interest you.

Mail the card. We pay the postage!

Numbers for advertised products can be found in the ad and in both the Product Index and the Advertiser Index.

recycled paper ocontains 10% post consumer waste



182 183 184 185 186 187 188 189 190

192 193 194 195 196 197 198 199 200

ree atalog

582 583 584 585 586 587 588 589 590 582 583 594 595 596 597 598 599 600

Please print or type all information

Name **Title**

Co.

For faster results just fax this sheet to 413/637-4343

Please include your fax number where indicated.

Address

City

State

Phone

Fax

Check box and fill in the appropriate information to subscribe to Macworld. You will be billed \$24.95 for a 1-year (12 issue) subscription (U.S. only).

Zip

Expires December 23, 1991 S1 October 1991



172 173 174 175 176 177 178 179 180

182 183 184 185 186 187 188 189 190

191 192 193 194 195 196 197 198 199 200



592 593 594 595 596 597 598 599

Please print or type all information Name

Zip

Title

Co.

Address

City

State

Phone

Fax

Check box and fill in the appropriate information to subscribe to Macworld. You will be billed \$24.95 for a 1-year (12 issue) subscription (U.S. only).

Expires December 23, 1991 S2 October 1991

FACTS, FAST!

FREE PRODUCT INFORMATION. Get valuable information about the products that interest you. There's no cost; no obligation. Just fill out this FASTFACTS Information form. Circle the numbers for the desired products. Then mail the card. We pay the postage! For even faster results fill out and send the card via our FASTFAX.

Now fast...get the facts, the competition's gaining on you.

MACWORLD



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 215 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

Reader Service Department P.O. Box 5299 Pittsfield, MA 01203-9906 NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES



Moonlinkillinnikkinkinkinkinkinkink



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 215 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

Reader Service Department P.O. Box 5299 Pittsfield, MA 01203-9906







A QUICK & EASY PRODUCT INDEX FROM MACWORLD.

Simply use this index to find the page or advertiser of the products which interest you. Then, use the reader service number for our FastFacts Product Information Card located on the preceding page.

Page No.	Advertiser	Reader Svc. No.	Page No.	Advertiser	Reader Svc. No.	Page No.	Advertiser	Reader Svc. No.	Page No.	Advertiser	Reader Svc. No.
	SOFTWARE		1.4-3	ENTERTAINMENT		13	Shiva Corp.	-	1	MAIL ORDER	
	BUSNIESS		60 32	Inline Design Spectrum Holobyte	111 214	470	HARD DISKS/ STO				- Company of the Comp
58	AEC Software	83	32	Spectrum notobyte	214	172 54	Applied Engineering Contemporary Cybernetics	124 188	246-247		15
62-63	Apple			MULTIMEDIA		288	CORE Int'I	215	236	Aurora Industries	18
14-15	Caere Corp.	1	68	Paracomp	78	188-189	Ehman	144	264-265 269	Bottomline Diskette Connection	79
34	Checkfree Technologies	_	40	Truevision	38	178-179	Iomega	260	256-257	Dr. Mac	163
210 196	Claris Claris					102	Jasmine La Cia	126	253	Express Direct	184
168-169	Claris	_	1020	NETWORKING	91	30-31 10-11	La Cie La Cie	197 52	267	Hard Drives International	
98	Computer Associates	10	192C	Pacer Software	91	61	La Cie	195	238 266	Hardware Express Mac and More	87 85
6-7	Frame Technology	60		LANGUAGES		245	Mac Direct	140	157-160	Mac Avenue	-
183	Micro Planning International Microsoft	217	192B	Bimillennium Corp.	233	209	Mass Micro Systems, Inc.	207	245	Mac Direct	140
IFC-1 202	Microsoft		165	Symantec	154	289 194	Micronet Technology, Inc. Microtech Int'l.	113 80	83	Mac Zone, The	70
167	Peachtree Software	100				IBC	Mirror Technologies	243	72-79	Mac Zone, The	
86	Portfolio Systems	54				208A	NuDesign	_	218-225	Mac's Place	209
86	Portfolio Systems	56	40	SECURITY	239	217	Pinnacle Micro	132	44-53	MacCenter MacConnection	182
239	Softek Design	196	42	Secure-It	239	269	Tass Optical World, Inc.	211	262-263	MacLand	264
92	SoftSync/BLOC	367 210		UTILITIES					258-259	MacProducts USA	175
207 12	SPSS, Inc TBSP	25	190	Fifth Generation Systems	364		VIDEO	400	268	Macs Now	171
214	Teleware	76	42	GDT Softworks	317	185 192A	Intelligent Resources	135 31	255	MacTel Technology	142
			38	Salient	39	192A 40D	Orange Micro RasterOps	31	104-113	MacWarehouse	240 202
	VERTICAL		192B	Teknosys	190	24	W45000000000000000000000000000000000000	88	287 260-261	Printer Connection Thirdwave	156
192B	Bimillennium Corp.	233				40	Truevision	38	87-89	Tiger Software	139
	SoftSync/BLOC	367		MISCELLANEOUS		7.00			0, 00	rigor continue	100
12	TBSP	25		GDT Softworks	317		EXPANSIONS/UPO	RADES	1		
			192B	Teknosys	190	172	Applied Engineering	124	133		A DECEMBER
	WORD PROCESSII	NG				54	Contemporary Cybernetics				
70 36-37	Reference Software Wordperfect			HARDWARE		96	Xante Coffwere County	218 95			1. 11 177
30-31	Wordperiect		Bullimeconce	The state of the s		82	Software Security	90			
	CAD/CAM			COMPUTER SYSTI	EMS	L. L.	INPUT DEVICES				
187		336/337	53	Express Direct	184	18	Curtis Manufacturing	20	1100		ALC: N
32	Engineered Software	12	216	Genstar Rental Electronics	-	192D		180/181	WT see		
56	Graphsoft	46	238	Hardware Express	87				1000		
235	Virtus Corp.	219	40B-40C	IBM/PS-2 MacFriends	58		MISCELLANEOUS		91313		
	CD ROM		26 199	MacFriends	109	216			4 34		
208	Quantum Leap	82	255	MacTel Technology	142	208	James Burn International	107			
200	duantum coap		4	Outbound Systems	30	192D 205	Kensington Microware OCLI	180/181 374	1133		Market -
	COMMUNICATON				LHAT		Pacific Data Products				1
80	DataViz	36		PRINTERS							
217	Pinnacle Micro	132	5	Abaton	43	111110111111111111111111111111111111111					
		-500	69	LaserMaster	-		SERVICES				
1	FONTS	1 4 0	22-23 40A	Microtek NEC Technologies	63 257				14,256		
28 94	Blue Sky Research	14	33		244/246		ON-LINE		1000		
66	Image Club Postcraft International, Inc.	200	215	Pacific Data Products	-	177	Compuserve	319			
	TeleTypesetting	11	200-201		143		TRAINING		150 18		Will have
			213	Texas Instruments	313	67	TRAINING MacAcademy	106	100		BU ADROUGH
	GRAPHICS/DTP	Contract of		POARDS		07	macroaddilly	100	1		The total of
90	Aldus	_	RA.	BOARDS Daystar Digital	201		ACCESSORIES				
84	Altsys	35		Orange Micro	31	Carlot All Maria	Salar San		12123		4. 扩展设
28	Blue Sky Research Deneba Software	14 57	40D	RasterOps	401	1 14 7	FURNITURE		37.79	the same	· 有一种的。
	Fractal Design Corp.	no					Anthro	-			A STATE OF
6-7	Frame Technology	60		DIGITIZERS/SCANI	EVER HOUSE TO SERVE	28	MacTable/ Scanco	-			
94	Image Club	_		Advanced Vision Research Caere Corp.	47		MICORILANDO				
66 181	Postcraft International, Inc. QuarkXPress	200 295		Calcomp	3	222	MISCELLANEOUS IDG Books	_	4. Y. S.		
43	Supermac	118	174		303			255/256			Mar of the
	Timeworks	206	188-189		144	28	MacTable/ Scanco	-	110000		
						21		292			4750
	PERSONAL	110	1	DISPLAY	14.	205	OCLI	374	11/2/11		
34	Checkfree Technologies	-		In Focus Systems, Inc.	5						
9	Intuit	_		Micromac Mirror Technologies	92 243						
26 199	MacFriends MacFriends	58 109	16-17		178				11/1/99		THE PARTY OF
133	madi nonus	103		Global Village	9						
			71	Logicode	93						11-11-15
			29	PSI Integration Inc.	-	1 W.					11 43 5

100% FINANCING For purchases of \$1000 or More for **Businesses** with **Approved Credit**

NACCENTER The Center Of The Macintosh UniverseTM

MACINTOSH SYSTEMS

MacCenter Buys and Sells New and Used Systems



Texas Instruments microLaser

- Weitek RISC Processor
- Postscript Level 2
- 2.5 meg RAM
- Upgradable to 10.5 meg
- Automatic Port and **Emulation Switching**
- 6 Times Faster Than Other

PostScript Printers

The Rocketeer Has Nothing On The Turbo!

microLaser Turbo & Turbo XL microLaser PS17 microLaser PS35

\$47/mo* \$58/mo* \$1265 \$1565

MacUser #1 Personal Printer

Abaton LaserScript LX QMS P5410 \$70/mo QMS PS410 QMS PS815, 825

\$1555

CoStar Address Writer Call NEC Silentwriter2 Model 990 \$2895 NEW!!! AYSTAR ONE CARD FITS ALL! INCLUDING THE IIsi, LC & SE/30

DayStar again leads the Mac world by delivering incredible power, convenience and cross-platform transportability for the Mac. Buy one card now and transfer it to your new Mac when you trade up. Triple your performance. Math coprocessor available, 100% compatible with all standard software.

PowerCache 25 MHz, 40MHz & 50MHz available for Mac II, IIx, IIcx, IIsi, LC, & SE/30!

PowerCache 25 MHz \$600 PowerCache 40 MHz \$895 CALLII PowerCache 50 MHz SCSI PowerCard \$995 RAM PowerCard (Now Shipping) 5699

ALSO NEW!!

A CACHE CARD FOR BOTH THE IIci & IIsi! FastCache Ilci & Ilsi \$269

NewLife For the Mac SE, Plus,

SE 16 MHz 68030 (w/4 SIMM Sockets) SE 25 & 33 MHz 68030 (w/4 SIMM Sockets) \$795/\$1395 "BEST VALUE" MacWorld, July '91



SCANNERS

Adobe PhotoShop **Caere TYPIST** \$465 Sharp JX-450, JX-600 CALL UMax UG80 (256 Grey Scale) 5995 UMax UC630 Color (24-bit, 600 dpi) \$479

MONITORS





E-Machines E16 (why buy a Pivot?)

T16 **TX16**

Ikegami

CT20" Trinitron w/8 bit card CT20" Trinitron w/24 bit card eiko 14″& RasterOps 24S

MODEMS

\$2565 \$3495 \$979 RasterOps & SuperMac Systems Call!



Eagle Syquest Drive \$499

Eagle Duet \$995

Eagle 88 \$995

All Eagle Drives include a Metal Case, 15 Meg of Shareware & a 5 Year Warranty

DataPak DataPak 88 \$1195

\$305

Infinity 40 Turbo \$649 Infinity 88 Turbo \$1095

DATA

2400 bps

Challenger VP2400 Zoom V.42 bis \$175

9600/14,400 bps

Hayes Ultra 144 V.32 bis Practical Peripherals 9600SA UDS Fastalk 32/42 bis 5499 Call!

Courier 14.4 V.32 bis "Fastest V.32 bis", InfoWorld, 7/1/91

FAX MODEMS

\$1195

\$1895

\$2595

EMAC FaxModem 24/96 Call! Challenger

VP24/96 (9600 send fax) \$99 VP24/96SR (send & receive) \$149 Dove

DoveFax \$275 **DoveFax Plus** Global Village Teleport \$175 9600M Plus

\$599 14.4/9600 Ultima \$689 aton Interfa: 24/96

SYQUEST

44 MEG \$68 88 MEG \$149

OPTICAL CARTRIDGES

\$125

512K & 1024K

4 Meg \$130 (with trade in)

1 Meg Call!



Hayes Ultra

9600

812 San Antonio Street, Suite 406 • Austin, Texas 78701-2224 - Where Else?

FAX 512-476-3726 International Orders 512-476-7466

P.O.'s accepted with approved credit

e payments based upon 36 month FMV lease. ayments will vary based upon terms and credi Most products available in 110 volt & 220 volt.



E-Machines Display Systems

T16/XL24 - 16" Full-Page Display with accelerated 24-bit Color Card...\$2,795



ColorPage Displays with Color Card

\$1.195 (Mac Ilsi, Ilci & LC onboard video compatibility) E16, w/ Futura EX \$1,895 E16, w/XL8 \$1,990 E16, w/XL24 \$2,290 T16, w/8-bit card Call T16, w/XL8 \$2,295

Two-Page Displays with Color Card

\$2,545 TX, w/8-bit card TX, w/SE30 \$2,545 T19, w/8-bit card \$3,595

E-Machines Color Cards

Futura EX

24-bit accelerated Color Card for Apple 12" & 13 displays...\$795



T16 Upgrade Cards

\$ 795 XL24 \$1.095 (Call for more info on the expanding family of color cards)

CUTTING EDGE

Cutting Edge Hard Drives

W10/91

40 MB External \$395 105 MB External \$595 45 MB Removeable \$549

Macintosh Systems

Mac LC, 2/40 \$1,745 Mac Ilsi, 3/40 \$2,595 Mac Ilsi, 5/80 \$3,140 Mac Ilci, 5/0 \$3,565 Mac IIci, 5/105 \$3,965 Mac Ilfx, 4/0 \$4,875 Mac IIfx, 8/210 \$5,865

Complete Package Systems

Mac LC, 2/40 \$2,999 512K VRAM E16, Keyboard Mac Ilsi, 5/80 \$4,485 E16, Keyboard Mac IIci, 5/105 \$5,310 E16, Keyboard Mac Ilci, 5/105 \$6,095 T16, Keyboard Mac Ilfx, 4/105 \$8,295 T16/XL24, Keyboard



QMS Printers

QMS-PS 410

300 DPI Laser Printer with serial, parallel or AppleTalk auto switching...\$1,889



QMS-PS 810 **QMS-PS 815** \$3,795 **QMS-PS 825** \$4,395 ColorScript 100(10p) \$5,995

MICROTEK

Microtek Scanners

600GS

\$1,195

600ZS

600 DPI 24-bit Scanner with Photoshop...\$1,495



Leasing

Terms Available on most **Express Direct products**



DIRECT

All Systems



Macintosh Systems and E-Machines Displays Priced to Move...Today!

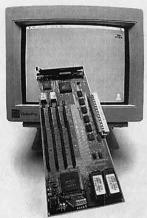
The Express Advantage

- Complete Mac Systems in stock ready for same day shipping
- 21-day Test-Drive-Program Available
- Full One Year Warranty backs most products
- Unlimited Toll-Free Telephone Support
- Experienced, knowledgeable Macintosh Sales Professionals
- Exclusive ExpressCareTM Service Agreement Guaranteed repair or replacement of most Express Direct products within 48-hours. One and two-year plans available. Some restrictions apply. Call for details!

-800-535-325

International Orders Shipped Daily • FAX 312.549.6447 Circle 184 on reader service card

Take Aim with MacTel



VisionPro Color Monitor Systems

VisionPro graphic cards are manufactured under license for MacTel. Our SP and SPS cards support multiple monitors, block mode transfer & acceleration, pan/zoom 2x & 4x and virtual desktop. With our monitors, they are an outstanding color solution.

8-bit ES card, 20" Triniton, 75 Hz\$2497

BusinessPRO

SystemPRO
8-bit SP card, 20" Triniton, 75 Hz\$2797
24-bit SP card, 20" Triniton, 75 Hz\$3349
SystemPRO Sony
8-bit SPS card, 20" Sony Triniton (GDM-1950), 75 Hz\$3544
24-bit SPS card, 19" Sony Triniton (GDM-1950), 75 Hz\$3997
Apple 13" RGB\$749
Hitachi 14" MVX Super (Hi-res w/ tilt & swivel)
Video Interface Cards
8-bit VisionST 813 (for Apple 13" or 14" color)\$275
24-bit VisionST 2413

(for Apple 13" or 14" color)\$375



Color Scanner

VisionPro C30	00,	
300 dpi w/ Ad	obe PhotoShop	\$1199





acTel Technology Corporation is a global corporation specializing in the design, manufacturing and distribution of a wide array of Macintosh peripherals. Our

state-of-the-art surface-mount manufacturing facilities are located in Austin, Texas, which also hosts the hard drive assembly line, research laboratories and testing center. Our sales offices in Switzerland, France, Germany and the U.S. enable us to provide prompt, courteous, reliable service support to fill your Macintosh needs worldwide.

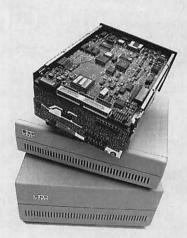


Storage Solutions

MacTel offers you a number of storage and backup solutions, including their complete line of Index hard drives. The MacTel 45R and the Index 1.2 Gb drives have been rated 4 mice by *MacUser* Labs.

Removable • Optical • Tape

1 GB Tahiti optical drive w/1 cartridge\$3699



Index Hard Drives

Quantum drives Index 3.5"	Internal	External
52 Mb, 12 ms, Slimline		
105 Mb, 12 ms, Slimline	\$389	\$469
210 Mb, 12 ms	\$699	\$779
425 Mb, 12 ms	\$1599	\$1679
Imprimis drives Index 5.25'	,	
320 Mb, 16ms	\$1179*	\$1279
330 Mb, 10.7 ms (Runner)	\$1299*	\$1399
640 Mb, 16 ms	\$1499*	\$1599
650 Mb, 10.7 ms (Runner)	\$1899*	\$1999
1.2 Gb, 16 ms	\$2299*	\$2399
	Mac II, IIx a	nd fx only



Index and VisionPro are registered trademarks of MacTel Technology.

for Your Apple Solutions

Index Memory modules

MacTel manufactures and tests their memory modules in-house to ensure the highest possible quality and reliability. All our SIMMs use *gold* traces and contacts and have a field test failure rate of *less than* 1%. We have so much confidence in our memory products that we back them with a *lifetime warranty*.

Prices are subject to change.

Keyboards

MacTel's Index line of ADB extended keyboards have an 105-key layout, 15 function keys, cursor control keys and number pad. The French, German and Swiss keyboards come with system software.

Index extended keyboard

English	\$99.00
French, German, Swiss	\$119.00



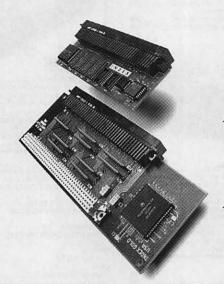
Macintosh CPUs and Systems

Mac SE/30	\$Call
Mac II SI	\$Call
Mac II CI	\$Call
Mac II FX	\$Call

ORDERING:

No surcharge for Visa or MasterCard. European banking service available. University, government, military NET 30 and corporate (on approval) purchase orders accepted. Please allow 10 days for personal and company checks to clear. Returned merchandise must be authorized. To expedite processing, call 512/451-2600 for RMA number. Defective merchandise will be replaced or repaired at MacTel's discretion. Shipping and handling charges are not refundable. Product must be in original shipping container including all packing materials. All products are subject to a 5% restocking fee. All products subject to availability.

1 Mb surface mounted/low profile 70/80 ns\$38.95	100
1 Mb fx & LaserWriter II SIMM, 70/80 ns\$39.95	
1 Mb x 9 SIMM 70/80 ns\$43.00	É
3 Mb Classic memory\$99.00	Š
Mac LC V-RAM upgrade\$69.00	2000
4 Mb surface mounted SIMMs/80 ns (IIcx, IIci, IIfx, IIsi and LC)\$149	
1 Mb TI microLaser PS 17/35 & XL upgrade\$69	
Maxima virtual memory managment software\$40.00	



Accelerator Boards

Increase the speed of your Mac ci up to 33% with MacTel's new CachePro card—offered at an amazingly low introductory price! Easy to install and DA controlled.

Index CachePro/Mac IIci\$119.00

On-board 68882/20 MHz math co-processor with adaptor for Macintosh IIsi. Free performance evaluation software included.

Index Mac II SI 030 Direct Slot Interface\$99.00

Accelerate math-intensive operations on your LC operations by up to 39% with a 68882/16 MHz math co-processor —and get a 15% overall CPU improvement.

Benchmark software included.

Index LC Mathmate.....\$99.00



ontact the professionals at MacTel now for additional information. We handle only the best in Macintosh hardware, systems and peripherals, with names like Apple, Nikon,

RasterOps, Wacom, Sharp and our own top-quality VisionPro and Index brands. Call or fax for a free catalog.

3007 North Lamar, Austin, Tx 78705 512 / 451 2600 514 / 451 3323 FAX

AppleLink: MACTEL.RS

To order from Europe, call 0041/46-054020

Swiss office: 042/36 44 33 French office: 88-77-83-20 German office: 0722/233 047.



800 • 950 • 8411

Circle 142 on reader service card

We Take Care Of You

Lowest Prices • Overnight Delivery • Money Back Guarantees*

Accessories

A	всом	
	CARRY CASE CI, CX,SI, IMGWTR	8
	CARRY CASE SE/PLUS EXTEND KBD .	8
	DUST COVER FOR CLASSIC.	
	PLUS OR SE	1



ARTICULATE SYSTEMS	
VOICE LINK	152
VOICE NAVIGATOR II	569
VOICE IMPACT	85
VOICE IMPACT PRO	175
FARALLON	
MACRECORDER 2.0	164
KEYTRONICS	
MACPRO PLUS	129
LOGITECH	
MOUSEMAN	79
MOUSE SYSTEMS	
LITTLE MOUSE ADB or MAC PLUS	79
TRIPLITE	
MACDIRECTOR	88
PHILLIPS & DUPONT	
650MB OPTICAL CARTRIDGE	146
VENTANA PRESS	110000000000000000000000000000000000000
SYSTEM 7 BOOK	19

Communications

ABATON	
INTERFAX 24/96	325
HAYES	
SMARTMODEM 2400 & SMARTCOM	399
V-SERIES ULTRA 9600 MODEM	782
PROMETHEUS	
24/96MSR FAX MODEM	265
9600/9600M PLUS V.32/42 MNP5	665
9600M-EC V.32/42 MNP 5	665
PROMODEM 2400 MINI MODEM	115
ULTIMA14,400 BAUD MODEM/9600 FA	X685
SHARP	
EBR-9600 BAUD MODEM W/MNP5	279
SHIVA	30000=0.0
ETHERGATE	1449
ETHERPORT	299
FASTPATH	1899

Storage





IOM		
B	ERNOULLI 44 MB TRANSPORTABLE.	959
3-	PACK CARTRIDGES (44 MEGS)	265
MAS	S MICRO SYSTEMS	
D	ATAPAK 45 REMOVEABLE HD	639
D	ATAPAK 88 REMOVEABLE HD	1250
MICE	ROTECH	
N	OVA 200	1175
N	OVA 320	1395



45 CARTRIDGE	79
INFINITY 40 SINGLE W/CARTRIDGE6	59
INFINITY OPTICAL34	31

Monitors & Boards

CACHE CARD FOR MAC IICI	189
CUTTING EDGE	The state of the s
DUAL PAGE MONITOR SYSTEM	1025
FULL PAGE SYSTEM FOR LC	549
FULL PAGE SYSTEM FOR SE/PLUS	549
E MACHINES	
QUICKVIEW STUDIO	1839
QUICKVIEW Z21	1839
T16 COLOR PAGE SYSTEM	
T19 19" COLOR SYSTEM	3599
TX 16" COLOR SYSTEM	2688
GENERATION SYSTEMS	
MAC CLASSIC 19" MONO SYS	1088
MAC II 19" MONO SYS	1988
IKEGAMI	
CT20 20" TRINITRON 24 BIT SYSTEM.	3499
CT20 20" TRINITRON 8 BIT SYSTEM	2799
MASS MICRO SYSTEMS	
COLOR SPACE SE OR PLUS	1195
COLORSPACE III	1255
COLOR SPACE IIFX	1650
DATAPAK	
QUICKIMAGE W/PHOTOSHOP	559
MICRON	
MACROCOLOR II 24 BIT VIDEO CARD	
GRAY-SCALE 30 8BIT CARD FOR SE3	
COLOR 30 VIDEO CARD FOR SE/30	
XCEED IICI CACHE CARD & REORDER	3245
NEC	
MACSYNC HC COLOR MONITOR	379

RASTEROPS	
24SI ACCELERATED BOARD	647
24STV COLOR DISPLAYBOARD	1295
8L DISPLAY BOARD	1299
24L DISPLAY BOARD	2699
19" COLOR TRINITRON MON	2699

Printers/Scanners

ABATON	
LASERSCRIPT LX PRINTER	1599
SCAN 300 COLOR	1375
SCAN 300/GS	1289
ANIMAS	
TRUE COLOR HAND SCANNER	585
CAERE	
TYPIST	469
DEST	
PERSONAL SCAN & RECOGNIZE	669
KODAK	
DICONIX PRINTER	399
LOGITECH	
SCANMAN SCANNER	299
MARSTEK	
MARS 800-MAC 64 HAND SCANNER	399



600ZS SCANNER\$1465
Capable of scanning 24-bit color, 256
shades of gray and black and white,
the new ScanMaker 600ZS captures
images with up to 600 dpi. The
ScanMaker 600ZS boasts color image
quality and features a new, compact
flatbed design. Included is a full
version of Adobe Photoshop.

	-
MICROTEK	
SCANMAKER 1850S SLIDESCANNER2	239
SCANMAKER 600GS GREYSCALE	118
SCANMAKER 600ZS COLOR SCAN	465
NEC	
COLORMATE PS MODEL 40	999
SILENT WRITER 2 MODEL 90	695
QMS	
COLORSCRIPT 100	795
QMS PS 810 LASER PRINTER	999
QMS PS 410	990
RELISYS	
TEFAX RA2125	855
UMAX	
UMAX COLOR 300	375

Business



XCEED Ilci -128CACHE CARD...\$245
Micron's Xceed Ilci-128, will increase
system performance up to 40% and
transfer data 2.5x faster than main
memory. Installs easily into the
processor direct slot (PDS) on your
Mac Ilci and is fully compatible with
Mac software, System 6 & 7. Includes
control software, 5 year. warranty and
toll-free technical support.

BASELINE PUBLISHING	
DATABASE 1.5	70
CAERE	
OMNIPAGE	499
CLARIS	
CLARIS CAD 2.0	625
FILEMAKER PRO	209
MACWRITE II	139



recording keystrokes as you type

CERES SOFTWARE	
INSPIRATION 3.0	115
DELTAPOINT	
DELTA GRAPH 1.5	117
DEST	
RECOGNIZE	475
FISHER	
IDEA FISHER	422
FRANKLIN SOFTWARE	
LANGUAGE MASTER	65
HYPERPRESS	
PICTURE LINK	199
INNOVATIVE DATA DESIGN	
DREAMS	
MACDRAFT	299
MANPRO	
GENERAL LEDGER PRO	799
MECA	
MANAGING YOUR MONEY	128
MICROSOFT	
EXCEL 3.0	308
MICROSOFT OFFICE	595
MICROSOFT WORD 4.0	248
PARAGON	
NISUS	238
PEACHTREE	
AT ONCE	299
INSIGHT EXPERT each module	535
REALITY	
WEALTH BUILDER	98
SOFTWARE DISCOVERIES	
RECORD HOLDER PLUS	78



Power, speed, precision and colorseparating abilities make Multi-Ad Creator the top-rated DTP program. Multi-Ad Creator is the high end choice for making ads-or any page-fast. "If you create ads, get it."-MacUser

SYMMETRY	
KEY PLAN	255
TIMESLIPS	
TIMESLIPS III 2.0	187
TIMESLIPS TAL MODULE	55
WOLFRAM	
MATHEMATICA 2.0	499
WORDPERFECT	
WORD PERFECT 2.0	285
WORDSTAR	
CORRECT GRAMMER	48
WORKING SOFTWARE	
QUICK LETTER	84
ZEDCOR	
DESK	199



OASIS 1.0 wWACOM 6"x9" TABLET\$945
Oasis is videographics/image creation
software offering tools designed to
meet the desktop video market. Oasis
provides an environment allowing for
visualization of ideas and ability to
simulate an unlimited array of traditional
techniques including painting, pencil,
charcoal, oil, pastel, and watercolor.
Tools include: HLS color system, video
legal color palette, graphics overlay on
video, reveal, linear keying capabilities,
video capture, alpha channel support
and the LightBox[™] feature. w/WACOM 6"x 9" TABLET\$945

Graphics & Publishing

ABRACADATA	
DESIGN INTERIORS	66
DESIGN LANDSCAPE	66
DESIGN ARCHITECTURE	66
ADOBE	
ENTIRE FONT LIBRARY AVAILABLE .	CALL
ILLUSTRATOR 3.0 W/ ATM	348
PHOTOSHOP	535
STREAMLINE	118
TYPE ON CALL	45
TYPE SET 1 OR 2	62
TYPEALIGN	65
ALDUS	
FREEHAND 3.0	388
PAGEMAKER 4.0	489
PERSUASION 2.0	319
ALTSYS	
FONTOGRAPHER	265
METAMOPHISIS PROFESSIONAL	88
CLARIS	
MACDRAW PRO	275
DELTAPOINT	
TASTE 1.01	89
DYNAWARE	
DYNAPERSPECTIVE 2.0	599
FARALLON	

FARALLON MEDIA TRACKS



Jaggies Are Gone

GOLD DISK	
ANIMATION WORKS	119
IMAGE EXPRES	
BROCHURES	139
DISPLAY ADS	109
FLYERS	109
FORMS	139
NEWSLETTERS	
LETRASET	
COLORSTUDIO	599
IMAGESTUDIO	138
MICROFRONTEIR	
ENHANCE	199
MICROSOFT	
POWERPOINT 2.01	269

MOTION WORKS	
ADDMOTION	177
MULTI AD SERVICES	
MULTI-AD CREATOR	498
PARACOMP	
FILM MAKER	429
MODEL SHOP	369
SWIVEL 3D PRO	429
QUARK	
QUARKXPRESS	519
RAY DREAM	
JAG	64
SPECULAR INTERNATIONAL	
INFINITY-D 3D RENDERER	645
STORM	
PICTUREPRESS	119
-	
Correct Grammar	12
DHILLDHY LUISAN SE	1



entence, to the education level of our intended audience.
ustomize Correct Grammar to respect our personal writing style or compare ne readability of your writing by
s 135,000 word dictionary. You can
dentifies errors in grammar, style, sage, punctuationeven spelling with
orrect Grammar for the Macintosh
ORRECT GRAMMAR\$48
WORDST'AR.

STRATA		
STRATAV	ISION 2.0 new version	595
SUPERMAC	SOFTWARE	
PIXEL PAI	NT PROFESSIONAL	499
SYMMETRY		
MARIAH		89
TIME ARTS		
OASIS		525
W/WACON	A TABLET	945
TIMEWORKS	3	
PUBLISH	IT EASY MAC	142
VISUAL DEV	ELOPMENT	
PRESENT	ER PRO w/MACRENDERI	MAN329
ZEDCOR		
DESK PAI	NT AND DRAW	99

Networking

CARAVELLE
MAC TO MAC 10 PACK210
FARALLON
STAR CONTROLLER 300889
STAR CONTROLLER ETHERNET1699
TIMBUKTU 4.0133
TIMBUKTU REMOTE 2.0133
HAYES
SMARTCOM II 3.282
INSIGNIA
SOFT PC243



ADOBE TYPE ON CALL......\$45
Type on Call is the most automatic, affordable way to select any Adobe® typeface you need. Just call to un-lock typeface you need. Just call to un-lock any typeface with instant access. With this purchase you will receive Adobe Type Manager(ATM) along with 13 typefaces plus 2 Adobe Font packages from our top selling list.



FF CUTTING EDGE

105 MB QUANTUM LPS 52 MB QUANTUM EXT LPS 45 MB QUANTUM EXT 45 MB REMOVABLE HD \$359 to value without compromise.

19" DUAL PG MON. SYSTEM ...\$1025
15" FULL PG MON. SYSTEM ...\$549

INTERNATIONAL BUSINESS	
DATA CLUB 10 PACK KIT	499
DATA CLUB 3 PACK KIT	175
MICROCOM	
CARBON COPY MAC	115
NUVOTECH	
NUVOLINK SC	359
NUVOLINK II	219
TURBONET DIN-8 or DB9	
TURBONET ST DIN-8 or DB9	
TURBOSTAR	869
SITKA	
MAC BUNDLE	185

Utilities/Programming

ADOBE	
ADOBE TYPE MANAGER 2.0	62
ALADDIN	
SHORTCUT	45
STUFF IT DELUXE 2.0	62
ASD	
FILEGUARD 2.5	137
AVERY	
MACLABEL PRO	47
BASELINE PUBLISHING	
EXPOSURE PRO	75
PERSONALITY	58
BERKELEY	
AFTER DARK	29
MORE AFTER DARK	
AFTER DARK/MORE AFTER DARK BDL	48
CE SOFTWARE	
DISKTOP 4.0	64
QUICKEYS 2	94



MORE AFTER DARK. \$28 NEW! -Over 25 add-on displays for After Dark. With contest winners Mowin' Man and Tunnel, plus new fish! Includes Virex-D virus detector module, and Lunatic Fringe space game.

AFTER DARK.....\$2
The ultimate Screen Saver. Over 35 displays including Flying Toasters and Fish! With sound and password ORDER BOTH & SAVE...

Commence of the latest and the lates	
ICOM SIMULATIONS	
HYPER TMON	56
ON CUE	
IMAGEN	
ULTRA SCRIPT PLUS	285
INSIGHT DEVELOPMENT	
MACPRINT	89
LANGUAGE SYSTEMS	
FORTRAN WITH MPW	398
WILD THINGS	119
MAGNA	
EMPOWER 1 SECURITY	119
EMPOWER 2 SECURITY	142



MICROCOM VIREX 3.0 VIREX 3.0 10 PACK.... MICROSPOT

MACPALETTE II ...
MULTI AD SERVICES

MULTI-AD SEARCH.



108

QUICK IMAGE..

SALIENT
DISK DOUBLER42
SERIUS
SERIUS DEVELOPER324
SERIUS PROGRAMMER194
SOFTWARE COMPATABILITY
SOFTWARE BRIDGE75
SYMANTEC
NORTON UTILITY86
SAM63
SUM II96
THINK C161
SYMMETRY
ACTA ADVANTAGE49
WORKING SOFTWARE
LAST RESORT36

Policies

- Visa, Mastercard & Amex accepted.
 Credit card is not charged until order is
- shipped.
 California residents add 8.25% sales tax *Hours: Mon-Fri 9:30-11 EST Sat 11-6 EST *Call (818) 504-1800 FAX (818) 504-9380
- Compatibility not guaranteed.
 All prices & policies subject to change without notice.

- Shipping
 \$3. Airborne Overnight continental US.
 Hardware over 10 lbs will be shipped
- ground. Same day shipping. Some areas may require an extra day.

- require an extra day.

 *Call for R.A. number before return
 Restocking fee may apply.

 *Money Back Guarantee

 *Most products have a 30-day money back
- guarantee. Please inquire when you order. Retain original packaging to ensure proper

International Dealer Program

- We ship regularly to 65 countries worldwide
- Call about our special pricing

Open an account within 24 hours

- Volume discount pricing
- School purchase orders accepted Fed. ID# 95-4183196

Circle 163 on reader service card



1-800-825-6227 from the U.S. & Canada

Fax: (818) 504-9380 Tel: (818) 504-1800 11050 Randall Street, Sun Valley, CA 91352 • (818) 504-1800



MacProducts USA



"The Magic 45 is one of the best SyQuest drives available, offering high speed and high quality." *** - MacUser

"The low price leaders are the MagicTape 60 and MagicTape 150, from MacProducts." - MacWorld

> MagicTape 60 "Fastest in it's class" *** - MacUser

MagicTape 1.3 "The winner in the DAT (1.3GB) category" - MacWorld Since 1985 MacProducts USA has been providing software and peripherals to the Macintosh community. In fact, no single company has been shipping Macintosh hard drives longer than MacProducts USA. Backed by a two year warranty and the MacProducts 30 day money back guarantee, MagicDrives are the safest bet in the business. As if that wasn't enough, MacProducts USA offers an optional overnight replacement warranty on all Magic hard drives, removables, and tape backups. That's Magic.

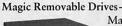


*MagicDrive Extended Warranty available \$75/ year

age ————	—buy	lease
Quantum mechanisms. 2 y	ear warr	anty.
52MB low profile	\$279	\$9
105MB low profile	\$439	\$14
170MB	\$730	\$22
210 MB	\$799	\$24
300MB Seagate*		
300MB Wren Runner*		
600MB Seagate*	.\$1899	\$60
600MB Wren Runner*		
1.2GB Seagate*	.\$2695	\$85
External Case Kit \$99 • In		







T CO	Duy	1CHOC
Magic SyQuest 45R	\$449	\$14
Magic SyQuest 88R	\$899	\$27
SyQuest Cartridge	\$67	\$2
1 GB Tahiti Maxtor		
600 MB Ricoh ISO	\$2599	\$78
600 MB Sony ISO	\$3199	\$96

CD ROM Drives

Magic CD ROM (Toshiba) .\$629\$19 Many CD-ROM software titles available!



Storage Options

Bernoulli Removable 44\$969\$29 Pinnacle REO130 Optical .\$2629 \$81 PLI Infinity Turbo 88\$1149\$41 MIcronet 88 Removable....\$1099\$36

MagicDrive Accessories

Double-Up compression\$175\$6 Magic SCSI II Accelerator ...\$899\$9

Affordable Macintosh System Sales and Leasing



Macintosh Classic System — buy — lease Classic with 4MB RAM, 40MB hard drive, keyboard, mouse\$1333\$40 With 100MB Hard Driveadd \$9

Macintosh LC System

Mac LC with 4MB RAM, 100MB hard drive, keyboard, 12" RGB or 14" 8-bit monitor.....\$2833\$85



Macintosh IIsi System Mac IIsi with 8MB RAM, 100MB hard drive, extended keyboard, and 14" color monitor\$3999\$120

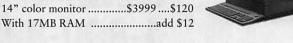


Macintosh IIci System -Mac IIci with 8MB RAM, 100MB hard drive, extended keyboard, mouse, microphone, System 7, and 14" color monitor\$4866\$146 With 24bit 20" Trinitronadd \$95

Macintosh IIfx System

Mac IIfx with 8MB RAM, 200MB hard drive, extended keyboard, mouse, microphone, System 7, and 14" color monitor\$3999\$120 With 24bit 20" Trinitronadd \$95

With IIci 64k Cache Cardadd \$5



MacProducts USA Carries Over 3,000 Products for your Macintosh

Affordable leasing available for the entire MacProducts USA inventory. Leasing prices are denoted in the gray shaded area.

Mag	gic Mem	ory
1 MB	SIMMs from	1
C	35	
Ψ	رر	
Lifetin	ne Guarantee	

	-buy	lease
1MB SIMMs 70/80/120ns	\$35	\$1
4MB SIMMs	\$179	\$6
16MB SIMMs	\$899	\$27
Apple Video RAM Upgrade.	\$69	\$2
Classic Upgrade 2MB	\$59	\$2
Classic Upgrade 4MB	\$99	\$2
GCC PLP II/S 1MB	\$69	\$2
GCC BLP II/IIS 2MB	\$139	\$5
HP 1/2/4MB\$99/\$17	9/\$239	\$3
MAC LC 8-bit Video RAM	\$79	\$3
Portable RAM 1-8 MB	.CALL.	CALL
QMS 2/3/4MB\$199/\$27	9/\$359	\$6
TI 1MB RAM Upgrade	\$75	\$3

Abaton 24/96 FaxModem\$295\$9 DoveFax 24/96\$289\$9 DoveFax 24/96 Plus.....\$353\$11 Prometheus Ultima 96\$699\$21

US Robotics Courier HST14.4..\$659\$20

2400 V.42 bis MNP-5\$175\$5

-	1000	-	an fe-
040			
藝門			

NEW! TokaMac 040
Accelerators starting
at only \$2149 for the
LC, SE/30, IIsi, & IIci.

Magic RailGun 030
"Ilci computing
power in a Plus"
-MacUser

—buy	lease
z\$1119	\$34
\$2599.	\$78
\$169	\$5
\$259	\$9
tors	
roughput.	E 100
1 yr warra	nty.
Classic.	100
3	-
֡	z\$1119 \$2599\$169 \$169 \$259 tors troughput. 1 yr warra Classic.

Magic RailGun030 16 MHz ...\$449 \$14 Magic RailGun030 25 MHz ...\$699\$21 Magic RailGun030 33 MHz ... \$999 \$30 16 MHz 68882 coprocessor...\$149\$5

-		100			
- 12	riı	٦t	P	T	1
		10	·	-	۶



PS/17 \$1319 PS/35 \$1649

		MINISTER 1
Apple StyleWriter	\$469	\$15
HP DeskWriter	\$529	\$16
QMS PS 815	\$3999	\$120
Dayna EtherPrint	\$359	\$11
HP LaserJet IIIP	\$1179	\$35
JetFill HP DeskWriter	Refill\$11	
NEC SilentWriter Mode	190\$1749	\$53
Seikosha SP2000 Dot M	atrix\$209	\$61

Magic 24/96 Baud FaxModem \$179

	Magic Modems & FaxModems	
4	Magic 2400/1200/300 baud\$69	\$3
	Magic 2400/9600 SendFax\$99	\$3
.32.	Magic 2400/9600 FaxModem .\$179	\$6

-	Magic 2400/1200/300 baud\$69\$	d
	Magic 2400/9600 SendFax\$99\$	3
600 baud V.32,	Magic 2400/9600 FaxModem .\$179\$	6
bo, V.42, V.42bis	Magic V.32 & V.42 Bis MNP-5 Modems	

Modems & Fax Modems-

	-	
1	E	
Magic	9600 baud V.32,	
	usho V 42 V 42hie	

466	46.7
1	
Magic	9600 baud V.32,
V.32 T	urbo, V.42, V.42bis
MAND	modem \$420

Magic	9600 baud V.32,
V.32 T	urbo, V.42, V.42bis
MANID	c madem 6420

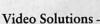
9600 V.32/V.42 bis MNP-5
Transmit up to 38.4k baud.

Transm	it up to	38.4k l	baud\$4	29\$14
				1000



		- 6100000
Asante 10T Hub	\$935	\$28
DaynaPort E/LC, SI, SE	\$285	\$9
Nuvotech Nuvolink II	\$279	\$9
Shiva FastPath 4	\$2089	\$63
Sonic Ethernet TnT SE,II,LC,IIsi	\$235	\$7
Magic Networking Solutions		
MagicNet (localtalk)	\$19	\$1

Magic EtherNet\$249\$8





Ikegami 20" Trinitron monitor \$2099

Magic 19" 24-bit color card \$1299

GoldStar 1450+ 14"RGB\$369	\$12
NEC MacSync 14" RGB\$449	\$15
Radius Direct Color 24 bd\$2559	\$78
RasterOps 24 STV\$1289	\$39
Seiko CM1445 14" RGB\$619	\$19
Magic Video Solutions	
Magic 19" B&W card\$999	\$30
Magic 19" 24-bit color cd II\$1299.	\$45
Magic 13" 8-bit color cd II\$269.	\$9
Magic 19" 8-bit color cd II\$499.	\$15

Scanners



Caere Typist Hand Scanner	\$479	\$108
MicroTek 1850 SlideScan	.\$2150	\$68
Microtek 600ZS	.\$1649	\$14

Software



Quark XPress \$489 System 7 \$85

	100000000000000000000000000000000000000	2000000
Claris Resolve NEW!	\$289	\$8
FileMaker Pro	\$199	\$6
Poxbase	\$285	\$8
Grolier Online CD ROM	\$220	\$7
Kid Pix	\$29	\$1
Liaison	\$269	\$8
Microsoft Word		- DESCRIPTION
MiniCAD +		1900000000
Mode32		. 3010030303
Norton Utilities		
PageMaker 4		Name of the last
PhotoShop 2.0		· 9000000000
Quark XPress		· 100000000
Radar Network Administrat		> 400 KK 1000
RoboSport		
Soft PC/AT EGA Bundle		10000000
StrataVision 3DSRX Renderman		ALCOHOL:
Symantic Anti Virus 3	A CONTRACTOR OF THE PARTY OF TH	-
Symantic Utilities Mac		
Warner Beethoven CD RC	Allegation	
	4000	

To Order Call: 1-800-622-3475 or (512) 472-8881 M-F 8am-9pm Sat 10am-6pm Hours: (512) 472-8881 ext 631 **Cust. Service** Tech. Support: (512) 472-8881 ext 628 24 hr Fax Line: (512) 499-0888

Intl. Orders: Call or fax Leasing: Yes! Flexible terms & quick approval make it easy to lease. Tax: Texas Residents add 8%

order is shipped! Wire transfers, approved company and institutional PO's. (Net 13). \$5 charge for COD, cashiers checks.

Shipping: Federal Express. \$10 min shipping charge. All major carriers available.

major carriers available.

Returns: Returns require RMA #. Please call (512)
472-8881. Ext 631. All returns subject to a restocking fee.
Shipping and handling not refundable. Opened software is not

returnable. All Magic products (except memory) carry a 30 day money back guarantee (call for details). Terms: Item availability and price subject to change without notice. Some products subject to back order,

Address:

MacProducts USA 608 West 22nd Street Austin, Texas 78705

HR FAX 512-499-0888

Peace of mind.

New Board Members



LCFPU16MHz—\$119

Speed up math calculations on your LC. Up to 40MHz available. Call for pricing.



IIsi 64K CacheCard \$199

40% performance increase.



IIsi 030 Adaptor—\$59

Faster than Apple's NuBus adaptor runs at 20MHz, not 10MHz.



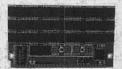
IIsi 20MHz FPU—\$75

(Requires slot adaptor.)



IIci 64K Cache Card \$159

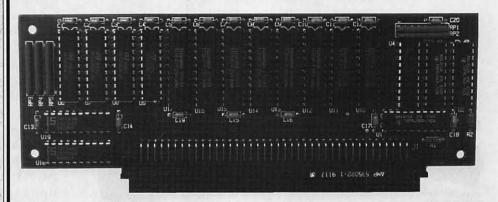
40% performance increase. Industry standard 64K!



8 & 16Mb SIMMs

For memory intensive applications like Photoshop. For Ilci, Ilsi, Ilfx. Call for pricing.

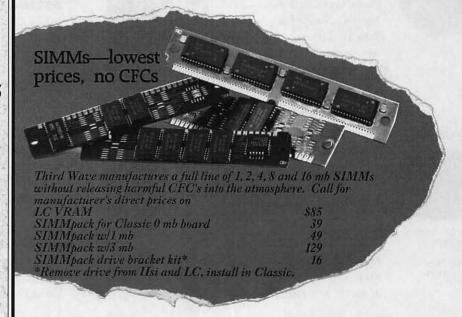
Introducing Logica's Triple Crown for the IIsi. 64K Cache. 68882. '030 Slot Adaptor. Performance. Math Speed. Expandability.



Your Hsi never had it so good! Now with Logica Research's unique new Hsi enhancements, all your options are open. For instance, let's say you want a faster IIsi. Just purchase the LogiCache IIsi 64K— an immediate 40% speed improvement. BONUS—you don't need a slot adapter to use it! It plugs right in your IIsi slot. Best of all, if you need another expansion card (video, Ethernet, etc.) in the future, just purchase the Logica '030 Slot Adaptor-which allows the use of the LogiCache AND the second expansion card! Want faster math speed? Add a 20 MHz 68882 to the Slot Adaptor. You can buy them all at once, or one at a time as your needs grow—no penalties.

Hsi Cache Card \$199 Hsi 030 Slot Adaptor IIsi FPU

Make your IIsi faster than a stock Ílci with LogiCache IIsi.





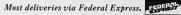
Third Wave Computing

1826B Kramer Lane. Austin, TX 78758

(800) 284-0486

(512) 832-8282 (512) 832-1533 (FAX)

Graphic Design Three A. D. Inc., 1991. Photography Glack Puryear Photography, 1990/91, Glohn D. Mitchell of Info Photography, 1991, and Third Wave, 1991.





Free with all our drives.

Breathe a sigh of relief. Our drives come with a 2 or 5 year factory warranty.

To minimize hard drive failure, we use only high quality mechanisms that come with extended warranties. Our Quantum drives come with a two year revolving warranty. Micropolis drives are covered by a 5 year factory warranty. Since time is money, we'll do our best to get your system up within hours. If you experience a drive failure within the first year, we can replace your drive with an identical one within 24 to 48 hours."

Break the \$3,000 barrier on optical storage.

Take advantage of the Sony Optical 600 drive at only \$2,995.





XAPSHOT. The quickest way to bring 24- bit images to your Mac.

Take a look at the new XAPSHOT still video camera from Canon. XAPSHOT allows you to import high quality still video images to your Mac using a frame grabber. It stores up to 50 images on 2" diskettes and can be connected to your TV for previewing. Great for video, slide graphics and print work. Demo Diskette shipped overnight for only \$10.

XAPSHOT Bundle w/24-bit frame grabber \$749 2" video diskette

Media

Teac CT600H (60mb)	\$17
Teac CT600N (150mb)	24
SyQuest SQ400 (44mb)	70
SyQuest 800 (88mb)	149
4mm DAT Tape, 60 meter	19
Optical Cart (ISO) 512/1024	149



RasterOps Products			
364 Frame Grabber	\$695	Radius Products	
24S-24Si-264 SE30	559/769/649	Radius Rocket	\$2495
8L-24L Systems		Direct Color/GX NTSC	590
SuperMac Video System	ns Call	Radius Color Pivot	1425
Seiko Trinitron 14"	589	Color Pivot Interface	575
Seiko ColorPoint Printe	rs Call	Radius 19" 24 bit	
DayStar Powercards	Call	Color System	4750
Microtek 600ZS Color S	Scanner 1599	Radius Accelerators	Call
Ethernet Cards	Call		

Ouietest and fastest drives.

When it comes to performance, noise level, price and speed, our drives are your best all-around choice. In fact, Macworld rated our 105x the fastest of all drives



in its category. ** Our drives were also the quietest tested.*** Macworld also said Third Wave has "one of the best manuals" as well as "Third Wave has a solid track record,"**** In the hard drive business, it's not just what you buy, but who you buy it from that makes the difference. So what are you waiting for?

Internal & External Disk Drives

10 14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Internal	External
40* Special Offer!	\$199	\$289
52L*	270	360
105L*	420	510
170	660	750
210	750	840
320	1250	1340
425	1810	1900
650	1640	1740
1000	2350	2450
1350	3190	3290

The most affordable DATadriveTM on the market, -\$1495.

Third Wave's DATadrive™ with Retrospect—backup an entire network on a single DAT cartridge. Now available with 2 gigabytes of storage.



SyQuest, Tape, DAT, Optical

	A CONTRACTOR OF THE PARTY OF TH
45SR SyQuest, one cart	\$475
45DR SyQuest, two carts	990
88SR SyQuest, one cart	1149
88DR Dual SyQuest, two carts	2249
150t Teac Tape Backup	595
DATadrive ™ 2.0 DAT Backup	1495
OptiDisk ™ 600 Sony Optical Drive	2995
OptiDisk™ 1000 Tahiti Optical Drive	3800

*Low power internal drives that meet Classic, IIsi and LC power specifications. Premium enclosure with universal power supply available, All drives pictured are in premium enclosures.

(800) 284-0486

(512) 832-8282 • (512) 832-1533 (FAX)

*Cross shipment is subject to product availability and cross shipment guidelines.

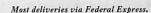
*Highest SCSI Evaluator Read/Write of any drive tested, September '91 MacWorld review.

**"Quietest drives tested"—March '91, Macworld reivew.

****September '91, Macworld review.

Third Wave Computing 1826B Kramer Lane, Austin, Texas 78758





MacLand

America's Largest Macintosh Hardware Source

Hard Disk Drives

Internal Drives

For the: MacClassic, Mac SE, Mac SE/30, Mac Ilcx, Ilci, Ilsi, Mac II, and Mac Ilfx.

Quantum Two Year Warranty

52 Megabytes 9ms	\$249.99
105 Megabytes 9ms	
170 Megabytes 12ms	
210 Megabytes 12ms	\$689.99
405 Megabytes 12ms \$1	

Seagate Two Year Warranty

426 Megabytes 14ms......\$1,499.99

Internal Drives

For the: Mac II, IIx and Mac IIfx.

Seagate Two Year Warranty

Wren Runner 337	
10.7ms	\$1,399.99
Wren 676 15.5ms	\$1,649.99
Wren Runner	
676 11.9ms	\$1,899,99
Wren 1.2 Gigabyte	
16ms	\$2,499,99

External Drives

Quantum Two Year Warranty

52 Megabytes 9ms	\$359.99
105 Megabytes 9ms	\$499.99
170 Megabytes 12ms	\$699.99
210 Megabytes 12ms	\$799.99
405 Megabytes 12ms\$	

Seagate Two Year Warranty

Wren Runner 337			
10.7ms	\$1	,499.	99
Wren 676 15.5ms			
Wren Runner 676			
11.9ms	\$1	.999.	99

Wren 1.2 Gigabyte 16ms \$2,599.99



Quantum External Hard Drive

Removable Hard Drives

SyQuest

42 Megabyte Removable

\$399.99*

84 Megabyte Removable \$699.99*

*Cartridge Not Included



SyQuest Removable Hard Drive

SyQuest Removable Cartridges

44 MegabyteCartridges

Single Cartridge\$68.99	Each
Five Pak\$66.99	Each
Ten Pak\$63.99	Each

88 Megabyte Cartridges

Single Cartridge	\$119.99 Each
Five Pak	
Ten Pak	\$109.99 Each

30 Day
Money
Back
Guarantee
on all Hard
Disk Drives!

Printers



CrystalPrint MacPublisher



HP Desk Writer

PostScript® Laser Printers

NEC

IVE
SilentWriter Model 90\$1,599.99
OKI
Model 840\$1,799.99
QMS
PS410\$1,875.99
Qume
CrystalPrint

CrystalPrint
MacPublisher\$1,599.99
CrystalPrint
Publisher II\$1,995.99
CrystalPrint
Express\$3,495.99
The state of the s

Texas Instruments

PS17 Microlaser\$	1	,345.99
PS35 MicrolaserS		

Ink Jet Printers

Apple

StyleWriter\$479.99

Hewlett Packard

DeskWriter\$499.99
PostScript® is a registered trademark of Adobe Systems Incorporated

To Order Call 1-800-888-8779 Customer Service Call 1-800-388-3118 24 HR. Fax Line (602) 345-2217

Software

OULLWAILE		
Acius 4th Dimension	\$489.99	
Adobe		
Illustrator		
Aldus		
Freehand		
Persuasion		
PageMaker	\$499.99	
Claris		
FileMaker Pro	\$219.99	
MacDraw Pro		
MacProject		
SmartForm Designer	\$399.99	
Frame		
FrameMaker	\$795.99	

Monitors

Quark Express\$519.99

Letraset

Quark

magnavox Two Year V	Varranty
14" Color Monitor	\$469.99
14" Color with 8 bit	
Video Card for Mac II	.\$699.99
14" Color with 8 bit Video	
Card for Mac SE/30	.\$699.99
14" Color with 24 bit Video	
Card for Mac II	\$799.99
NEC	
MacSync 14" Color	.\$449.99
Radius	
Pivot Ilci/Ilsi	\$749.99
Color Pivot Ilci/Ilsi	
Seiko	
CM1445 14" Color	\$589.99



Magnavox Professional Monitor

MacLand Credit Card Instant Credit NOW!



-			
	~	m	9
	•	ш	•

PageView GS	\$569.99
L-View Multimode\$	1,199.99

Sony

1304 14" Color\$699.99

Video Cards

Micron

8 bit SE/30 640x480	\$289.99
8 bit I! 640x480	\$299.99
24 bit II 640x480	\$495.99

RasterOps

24si Color Board	\$599.99
24s Color Board	\$425.99
264STV\$1	,199.99
364 Color Board	\$699.99

Scanners

Cannon

XAPSHOT 24 bit Bundle.....\$769.99

Microtek

600ZS Color\$1,479.99
600GS Gray Scale\$1,199.99
Slidemaker Slide
Scanner \$2.099.99

Keyboards

Key tronic

MacPro Plus\$139.99

Modems

Abaton

24/96 Send/Receive Fax Modem.....\$299.99

Practical Peripherals

Zoom

24/96 Send/Receive	
Fax Modem	149.99

Memory

Mac Plus/SE 100ns\$35.99
Mac II, IIx, IIcx, IIci,
llsi 80NS\$41.99
Mac IIfx 80NS\$59.99
4 Megabyte Module 80NS\$179.99
Apple LaserWriter
IINT, IINTX\$69.99
QMS PS410 2 Megabyte \$249,99
QMS PS410 4 Megabyte\$399.99
Texas instrument Microlaser
1 Megabyte Upgrade\$99.99

CD ROM

RTM

RC 680M CD Player\$459.99

CD Software Special

Get \$600 worth of software programs for only \$139 when you purchase an RC 680M CD player from MacLand. You get illustrated Encyclopedia, World Atlas, and Time Table of Science & Innovation. The bundled price of the RC 680 CD Player and software is only \$598.99!

Accelerators

DayStar

Fast Cache Ilci.....\$269.99

Micron

Ilci 128K Cache Card......\$239.99

Radius

Rocket 040\$2,295.99

/IRBORNE EXPRESS.

Circle 264 on reader service card

To Order Call 1-800-888-8779 Customer Service Call 1-800-388-3118 24 HR. Fax Line (602) 345-2217



Quark XPress \$449 Free upgrade to XPress 3.1. A \$100 Value! Expand the power of Quark XPress with XTensions. Ask about our wide selection of XTensions.

Seiko CM-1445 \$545 14" color Trinitron with tilt/swivel base

Abaton

Abaton Interfax 24/96 \$275 2400/9600 fax/modem. MacUser Eddy Award Winner!

PLI Infinity 40 / Infinity 88 \$599/\$999



Macintosh IIsi 3/40 \$2499



GCC Laser Printers Includes Free ATM!



Macromind Director NEW 3.0 \$618



Caere Typist Chinon CD-ROM

Courier 9600 V-32 MNP-5

SyQuest 45R Cartridges \$64

1.2. & 4 MB SIMMs

\$35, \$99 & \$179



329

1139 Microtek 600GS with PhotoShop LE Motornia PMMI I 68851 1995 4100 LOW LOW LOW INW LOW 175 325 Call 469 11 Call 1849 115 Call

HP DeskWriter \$469



TokaMac 040 Accelerators LC, SE/30, IIsi, IIci



Mass Micro Quick Image 24

OMS PS-410 \$1759



Macintosh LC \$1715



SYSTEMS I SYSTEM LEASING NOW AVAILABLE

IVIDU UIDSSIU	020
Mac LC	1715
Mac Ilsi	2499
Mac SE/30	2240
Mac Ilci	3440
Mac Ilfx	4900
NEW! Mac 040 Models!	Call
NEW! Macintosh Portables!	Call
HARDWARE COMME	
SIMMs: all types/best prices	Call
Apple 13" HighRes RGB	639
	10-11

Apple ImageWriter II 415 Apple StyleWriter 425 Apple LaserWriter II NTX 3399 Apple Personal LaserWriter LS 915 Apple Personal LaserWriter NT 1750 Abaton 300 Scanner w/PhotoShop 1049 ATTO Ilci Cache Card 149 All Asante Ethernet Cards

Cutting Edge Full Page Display w/Card 485 Cutting Edge 2 Page Display w/Card 880 Datadesk Keyboard 101E 115 DataProducts PS level 2 printer 1960 DigiVideo Color TV from AAps 199 Dove Fax 24/96

525

695

Microtek Monitors

14" Macintosh color monitors with tilt and swivel base

MD 1403 color Trinitron \$599 MD 1404 color Hitachi \$499



Dove Fax 24/96 Plus E-Machines E16 - NEW F-Machines T16 E-Machines T19 **EMAC Silhouette** GCC PLP II Laser Printer GCC PLP IIS Laser Printer GCC BLP Elite Laser GCC BLP II Laser Printer GCC BLP IIS Laser Printer Global Village Teleport with FAX Hayes Smart Modern 2400 Hewlett Packard Lasers Hewlett Packard DeskWriter HP DeskWriter Ink Refill Howtek Scanners Ikegami CT-20" Trinitron Keytronic MacPro Plus Keyboard LinoType 330 & 550 with RIP Logitech ScanMan 32 299 Mac 386 1510 Mac Recorder Digitizer Only

NFC Monitors & CD ROMS Call NEC Silentwriter II Model 90 1589 PhoneNet Star Controller 799 PhoneNet 10 Pack 188 Practical Peripherals 2400b 164 Practical Peripherals MacPak 225 Adobe Illustrator 3.0

\$335 **TECCO**

NEW! Adobe Photoshop 2.0 \$515



1118

109



QMS ColorScript	Call
QMS PS-410	1789
QMS PS 410 2MB Upgrade	240
QMS PS 410 4MB Upgrade	390
QuickMail 10 User	285
Roland CAMM1 & Signpost so	oftware Call
Seiko CM-1445	545
Seiko Smart Label Printer	176
Sharp Scanners All Models	Call
Shiva Net Modern v.32	1230
Sigma Double-Up Card	189
Silverview S4/S8	1660/1995
Fusion TokaMac 040	Call
TI microLaser PS XL 17	2449
TI microLaser PS XL 35	2799
Ti Envelope Feeder	244
TI microLaser 1MB Kit	68
Timbuktu/Remote Access Pak	732
Toshiba CD-ROM XM 3201A	685
Turbo Mouse	101
ZOOM 2400 Baud ModertyFax	99
ZOOM 24/96 Send/Recive Fax	170





International, or Federal Express. We stock 220v versions of most hardware and 220v converters are available. Dealer inquiries are welcome. Language interpreters are available. Internationale Händlerkonditionen.

INTERNATIONAL SALES FAX (512) 476-6399 Bottom Line Distribution 1800 Rio Grande, Austin, Texas 78701



Turbo microLaser PS/35 \$1949
9 ppm output • Postscript Level 2 RISC processor
Appletalk interface included on all models

16ppm Turbo microLaser PS/35 XL \$3129

TI microLaser PS/17 \$1245 TI microLaser PS/35 \$1545

Appletalk interface included on all models 1MB TI Upgrade \$68 • Replacement Toner \$55 Microtek 600ZS \$1425 600 DPI 24-bit Scanner with Photoshop 2.0

Microtek 600GS \$1118 600 DPI Greyscale Scanner with Photoshop LE Microtek ScanMaker 1850s Slidescanner \$1960





Aldus Design Team

Aldus Freehand 3.0

Aldus PageMaker 4.01

Raster()ps **NEW!** PowerCache for the



39

325

171

97

181

399 225

183

MS Excel 3.0

MS Word 4.0

MS Works

radius**



LC, 5L/ JU, II, IISI, IICA, CX	псі
DayStar pricing now same for all Macintosh	models!
25 MHz PowerCache	\$628
40 MHz PowerCache	\$817
40 MHz PowerCache with 68882 coprocessor	\$1006
50 MHz PowerCache	\$1447
50 MHz PowerCache with 68882 coprocessor	\$1699
NEW! FastCache IIsi	
FastCache IIci	\$249

IC SE/30 II IIci IIcy & IIci

	100
RasterOps 364IT'S BACK!	\$640
RasterOps 24STV	
RasterOps 24si	
RasterOps 24s	\$379
RasterOps Video Expander (NTSC or PAL)	\$486
RasterOps 24XLTV	\$3199
RasterOps 8L 8-bit/24L 24-bit card\$129	99/\$2599
RasterOps 19" Trinitron/ 19" Hitachi\$269	99/\$1850
RasterOps ClearVue (Mac II) /Grayscale\$119	4/\$1525
RasterOps ClearVue SE w/ 16MHz Accelerator.	\$1550
RasterOps 8LC System (19" 8-bit color w/ card)	\$2856

	MINESES P
Radius Rocket 040 Accelerator	\$2299
Radius Pivot/ Color Pivot\$7	10/\$1399
Radius Color Pivot Interface II, IIsi, LC, SE/30	\$549
Radius Two Page Display 19"	\$975
Radius Two Page Display 21"	\$1249
Radius Two Page Interface II, IIsi, SE, SE/30	\$415
Radius Color Display 19"	\$2999
Radius Color Display 21"	\$3149
Radius 24 bit Interface 72 DPI	\$2515
Radius QuickColor Graphics Engine	\$275
Radius Precision Color Calibrator	\$485

299

225

179

DRIVES & IAPES	
Bernoulli 90MB w/ interface	814
Bernoulli 90MB TriPak	404
MicroNet 88mb Removable	949
Syquest 88MB Cartridge	148
PLI Super Floppy	399
Quantum 52MB LPS	269
Quantum ProDrive 80MB	395
Quantum 105MB LPS	395
Quantum ProDrive 170MB	730
Quantum ProDrive 210MB	799
Internal/External Drive Kit	29/99
Syquest 44Mb Mechanism	349
SOFTWARE IN THE	
4th Dimension 2.2	469
Adobe Illustrator 3.0	335
Adobe Fonts	from 64
Adobe PhotoShop 2.0	515
Adobe Type Manager 2.0.2	54
Adobe Type Reunion	36
After Dark 2.0u	22

DDIVEC 9 TADEC

Aldus Persuasion 2.0	299
At Once!	273
Bitstream TrueType Font Pack 1 & 2	55
Canvas 3.0	239
Carbon Copy 2 Pack	153
Claris Resolve	249
DiskFit 2.0	57
Inkjet Refi A clean, inexpensive solution recharging HP DeskWriter car	for r-
tridges. Colors available. Per	m-
anent ink. Now available for	
the StyleWriter.	
Single Pak	
\$1095	

Double Helix 3.0
Farallon Media Tracks
Fastback 2.1
FileMaker Pro
FilmMaker
Fontagrapher 3.2
FontMonger
Foxbase +Mac
FrameMaker
Freedom of the Press 3.0
Letraset Color Studio 1.0
Letraset Design Studio
Lotus 1-2-3 for Macintosh
MacDraw Pro
MacProject II
Macromind Director 3.0
Macromind MediaMaker
MacWrite Pro
Managing Your Money 4.0
MasterTracks Pro
MicroPhone II 4.0

Disk Doubler 3.7

379

M	liniCAD 3.0	469
M	lore 3.0	249
No	orton Utilities Mac 1.1	74
Or	mniPage 2.1	459
Pa	assport Encore	335
Pa	assport Midi Interface	63
Pi	ixelPaint Professional 2.0	479
	Mac LC M CoProces. or Mac LC VRAM Up Upgrade your Mac \$99	SOY grade

Quark XPress 3.0 w/ free upgrade	449
Quick Keys II V.2.1	87
Retrospect	131
Simply Accounting	201
Soft PC	215
Soft PC 2.0 Classic	95
Stratavision 3D 2.0	579
StrataFlight	109
Studio/32	399
Stuffit Deluxe 2.1	48
SUM II/ SAM 3.0	87/58
SuperCard 1.5	180
System 7.0	85
Think C 4.0	153
Think Pascal 3.0	159
TOPS 3.0 Network Bundle	172
Ultra Paint	115
Vellum 2.0	1399
Virex	46
Wealth Builder	129
White Knight	75
WordPerfect 2.01	265
	Ouick Keys II V.2.1 Retrospect Simply Accounting Soft PC Soft PC 2.0 Classic Stratavision 3D 2.0 StrataFlight Studio/32 Stuffit Deluxe 2.1 SUM II/ SAM 3.0 SuperCard 1.5 System 7.0 Think C 4.0 Think Pascal 3.0 TOPS 3.0 Network Bundle Ultra Paint Vellum 2.0 Virex Wealth Builder White Knight

HOW TO ORDER Payment: Visa, Mastercard, Discover (no surcharge), checks, and COD's. \$6,000 maximum on COD's Tax: Texas residents add 8% sales tax. Prices and items subject to change and availability.

International: 5% surcharge on international orders. Mail In: Orders accepted with a \$10 surcharge, Terms: You are not charged until your order is shipped. Phone charges cannot be refunded. Shipping: minimum \$5-UPS Ground, Blue, Red, Federal Express. *Returns must be in original condition and package and require an RMA*. Seal must not be opened on software. Returns may be subject to a restocking fee. Ask for details when ordering. Bottom Line Distribution cannot be responsible for errors in typography or photography.

Twin Pak

\$18.95





Fax: 1-900-420-8770

1800 Rio Grande, Austin, Texas 78701



CPU's and More...

Free 1200 Baud Hayes Modem!

Buy any Apple system and a monitor from Mac and More and we'll give you a modem. But supplies are limited so place your order while they are still in stock!!!

Macintosh Classic	\$875.0
Macintosh Classic 2/40	\$1275.0
Macintosh Classic 2/52	\$1299.0
Macintosh LC 2/40	\$1779.0
Macintosh LC 4/105 w/ 512K VRAM	\$2299.0
Macintosh IIsi 3/40	\$2575.0
Macintosh IIsi 5/120	\$3225.0
Macintosh IIci 5/0	\$3499.0
Macintosh Ilci 5/105	\$3975.0
Macintosh IIfx 4/0	\$4879.0
Macintosh Ilfx 8/210	\$5869.0
Macintosh SE/30 2/40	\$2299.0
Macintosh Ilsi NuBus Adapter Card	\$199.0
Macintosh Ilsi 030 Direct Slot Card	\$199.0
Apple IIe Card for Macintosh LC	\$149.0
PSI Crunch-It! math chip for Mac LC	\$129.0
Apple Extended Keyboard	\$160.0
Apple Standard Keyboard	\$90.0
MacPro Plus Extended Keyboard	\$124.0

Systems and More...

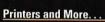
All of our packages are complete. There are not any hidden extras to buy.

Mac LC Student Package 4 Mb of RAM, 40 Mb internal hard disk, Mouse, Microphone, Keyboard, Apple 12" RGB monitor and StyleWriter printer.



13" RGB monitor, and Personal LaserWriter LS.

Mac IIci Designer Package 8 Mb of RAM, 170 Mb internal hard disk, Mouse, Apple extended keyboard, Radius Color Pivot with built-in video, and Apple Personal LaserWriter NT.



If you need it in print, the collection of printers we have to offer can't be beat in perfomance or price!

UuickUraw	
Apple ImageWriter II	\$429.00
HP DeskWriter w/AppleTalk Interface	\$525.00
GCC PLP II & IIS	Call
TrueType	
Apple StyleWriter	\$439.00
Apple Personal LaserWriter LS	\$929.00
Microtek TrueLaser	\$1795.00
First TrueType and Postscript compatible po	rinter
PostScript	
Apple Personal LaserWriter NT	\$1799.00
Apple LaserWriter II NT	\$2729.00
Apple LaserWriter II NTX	\$3399.00
Epson EPL-7500 with RISC processor	\$1949.00
GCC BLP Elite	Call

\$1299.00

\$1680.00

\$1649.00

TI MicroLaser PS17 w/AppleTalk

TI MicroLaser PS35 w/AppleTalk

NEC SilentWriter 2 Model 90

QMS PS-410

Internal Drives and More...

Quantum and Connor drives are the best on the market. They are fast and reliable. All ETC internal drives come with brackets, cables and software.

ETC 52 Mb Quantum LPS, 17msec	\$255.00
ETC 105 Mb Quantum LPS, 11 msec	\$420.00
ETC 120 Mb Connor-1", 19 msec	\$455.00
ETC 120 Mb Quantum PRO, 11 msec	\$579.00
ETC 170 Mb Quantum PRO, 11 msec	\$640.00
ETC 210 Mb Quantum PRO, 11 msec	\$699.00

External Drives and More. . .

ETC's external drives come in a zero-footprint hallheight cases with a Universal power supply, power outlets, push button SCSI addresses, cables, and formatting software.

ETC 52 Mb Quantum LPS, 17msec	\$330.00
ETC 105 Mb Quantum LPS, 11 msec	\$499.00
ETC 120 Mb Connor-1", 19 msec	\$530.00
ETC 120 Mb Quantum PRO, 11 msec	\$659.00
ETC 170 Mb Quantum PRO, 11 msec	\$699.00
ETC 210 Mb Quantum PRO, 11 msec	\$775.00

Big Hard Drives and More...

If you need lots of on-line storage, ETC's line with the Seagate/Imprimis WREN drives are the best value on the market. With a 5^{1} / $_{2}$ -inch form factor, the ETC Internal drives can be use in the Mac II, IIcx, and IIfx.

ETC 337 Mb WREN-Runner-1, 10.7 ms S1299.00 ETC 613 Mb WREN-5, 16.5 msec S1499.00 ETC 676 Mb WREN-6, 15.5 msec S1549.00	Internal ETC 307 Mb WREN-4, 16.5 msec	\$1199.00
ETC 613 Mb WREN-5, 16.5 msec \$1499.00 ETC 676 Mb WREN-6, 15.5 msec \$1549.00		
ETC 676 Mb WREN-6, 15.5 msec \$1549.00	ETC 337 Mb WREN-Runner-1, 10.7 ms	\$1299.00
	ETC 613 Mb WREN-5, 16.5 msec	\$1499.00
ETC 1.05 Gig WRFN-7 15msec \$2299.00	ETC 676 Mb WREN-6, 15.5 msec	\$1549.00
	ETC 1.05 Gig WREN-7, 15msec	\$2299.00
	External	William St.

CX(EIIIdi	
ETC 307 Mb WREN-4, 16.5 msec	\$1299.00
ETC 337 Mb WREN-Runner-1, 10.7 ms	\$1399.00
ETC 613 Mb WREN-5, 16.5 msec	\$1499.00
ETC 676 Mb WREN-6, 15.5 msec	\$1599.00
ETC 1.05 Gig WREN-7, 15msec	\$2399.00

Removables, DAT and More. . .

If you and your data are always on the move, don't shut-down or backup without one of these.

ETC 45R Syquest Removable New low price includes one cartridge

ETC 88R Syquest Removable Now Shipping! Includes one cartridge

FTC 12 CL	DATT DI	\$1499.00
	DAT Tape Backup	\$1499.00
ETC 2.0 Gb	DAT Tape Backup	\$1619.00
45 Mb Syqu	est Removable Cartridge	\$64.00
88 Mb Syqu	est Removable Cartridge	\$140.00
60M DAT Ta	ape for ETC DAT 1.2	\$23.00
90M DAT Ta	ape for ETC DAT 2.0	\$43.00

Networks and More. . .

If you need networking solutions today, we can provide you with everything from BNC connectors, cables, and terminators to LocalTalk routers, EtherNet interface cards and Repeaters. Call us and we'll help you build you network at a price you can afford.

Phone network adapters	\$19.00	
AppleShare File Server Software 2.0	\$599.00	
NEW! Asanté MacCon+ 30iE/Radius	Call	
Asanté MacCon+ LC E&T	\$249.00	
Cabletron MR5000C Repeater	\$2389.00	
EtherNet Thick and Thin		
Macintosh II EtherTalk NB Card	\$499.00	
Asanté MacCon+ IIE or 30iE	\$249.00	
Asanté MacCon+ IIE64 or 30iE64	\$289.00	
EtherNet Thick and 10BaseT		
Asanté MacCon+ IIET or 30iET	\$249.00	
Asanté MacCon+ IIET64 w/ 64 K RAM	\$289.00	

Asanté MacCon+ 30iET64 w/64 K RAM

Video and More...

We have a complete collection of Apple and Apple compatible video products. Call us with your video requirements, and we will help you choose a video system that is right for you and your system.

Apple 12" Monochrome Monitor	\$229.00
Apple 12" RGB Monitor	\$429.00
Apple 13" RGB Monitor	\$669.00
Apple 15" Portrait Monitor	\$769.00
Apple Two Page Monitor	\$1199.00
Seiko 14" Trinitron RGB	\$619.00
Macintosh Display Card 4•8	\$439.00
Macintosh Display Card 8-24	\$545.00
Macintosh Display Card 8-24 GC	\$1349.00
512K VRAM Upgrade for Mac LC	\$99.00

High-end Video and More...

If you need to see more than 640x480, here are some of the most innovative video solutions around

Raster Ops

Mac II Systems	
RasterOps 8L Hitachi System	\$3299.00
RasterOps 8L Trinitron System	\$3999.00
RasterOps 24L Hitachi System	\$4579.00
RasterOps 24L Trinitron System	\$5269.00
CorrectColor Calibrator	\$1929.00
ClearVue/GS 19° Gray Scale System	\$1414.00
ClearVue/II 19" Monochrome System	\$1160.00

Mac LC and Classic Systems	
RasterOps 8LC 19" Hitachi System	\$3314.00
ClearVue/LC 19" Monochrome System	\$1160.00
ClearVue/Classic 19" Mono System	\$1160.00
Mac Display Boards	
RasterOps 24si Display Board	\$579.00

RasterOps 264/SE30 Display Board	\$579.00
RasterOps 8L Display Board	\$1279.00
RasterOps 8LC Display Board	\$579.00
Multimedia Boards	
NEW! RasterOps 24XLTV Board	\$3199.00
RasterOps 24STV Board	\$1169.00

\$198.00

\$475.00

24STV Acceleration Board

RasterOps Video Expander NTSC

The street	
Pivot Displays	
Color Pivot Display Ilsi and Ilci	\$1369.00
Color Pivot 8-bit System	\$1899.00
for SE/30, LC, II, IIsi	
Divot Display for Hei and Hei	\$770 no

for SE/30, LC, II, IIsi	\$975.00
Full Page Displays	
Full Page Display for Classic	\$899.00
Full Page Display for LC	\$909.00

run rage Display for Lo	3303.00
Full Page Display for Ilsi and Ilci	\$629.00
gets 16 shades of gray w/ built-in video	
Direct Color Systems	
DirectColor/8 with Color Display/19	\$4085.00
DirectColor/8 with Color Display/21	\$4215.00
DirectColor/24 with Color Display/19	\$5135.00

DirectColor/24 with Color Display/21	\$5265.00
Accelerators	
Radius Rocket	\$2349.00

Open 7 Days a Week

Mon thru Fri	Saturday	Sunday
9:00 - 12:00 est	9:00 - 9:00	12:00 - 6:00

Terms and Conditions:

Payment: Mac and MORE accepts Visa, MasterCard, CODs, and Purchase Orders. CODs are shipped Cash/Certified Check up to \$2500. Corporate and School Purchase Orders are Net-15 for orders over \$2500 only, and are subject to credit approval and an additional 3% surcharge. Warranties: We honer Apple warranties on systems sold through Mac and MORE. Beturn: All orders strumed or refused will be charged a minimum 15% restocking fee. Call for an RMA before returning. Returns must be in original packing with software soals unbroken. Shipping: For orders over \$1000 we ship to destinations in the continental US at no charge. Some large terms may not be necluded in this offer. Ask for details when ordering. Terms, Conditions, and Prices are subject to change without notice.



800-MAC-0052

813-886-9534 International 813-888-9535 Corporate Fax 813-881-0634 Fax

11266 West Hillsborough Ave. Tampa, FL 33635

Best Sellers and More. . .

If you don't see something that you need-call. Chances are we have it in stock!

Apple 7.0 Personal Upgrade Kit	\$99.00
MacAcademy System 7.0 Training Tape	\$62.00
Abaton InterFax 24/96	\$299.00
Adobe Type Manager 2.0	\$59.00
Adobe Illustrator 3.0	\$379.00
Adobe Photoshop	\$599.00
Aldus PageMaker 4.0	\$499.00
Aldus Freehand 3.0	\$399.00
Claris MacDraw Pro	\$285.00
Claris MacWrite II	\$139.00
Claris FileMaker Pro	\$215.00
Claris HyperCard 2.0 Development Kit	\$145.00
DoveFax Plus Modem	\$349.00
Kensington Turbo Mouse ADB	\$119.00
Microsoft Word 4.0	\$245.00
Microsoft Excel 3.0	\$309.00
Prometheus ProModem 9600MPlus	\$599.00
Quark Xpress 3.0	\$519.00



Scanners and More...

Scanners helped revolutionize the way graphics and text get to the desktop. Here are some of the best.

Caere Typist Hand Held OCR
Epson ES-300C Color Scanner
includes interface and software
Logitech ScanMan-32 Hand Scanner
Microtek 600ZS Color Scanner
Includes Adobe Photoshop
S479.00
S1499.00

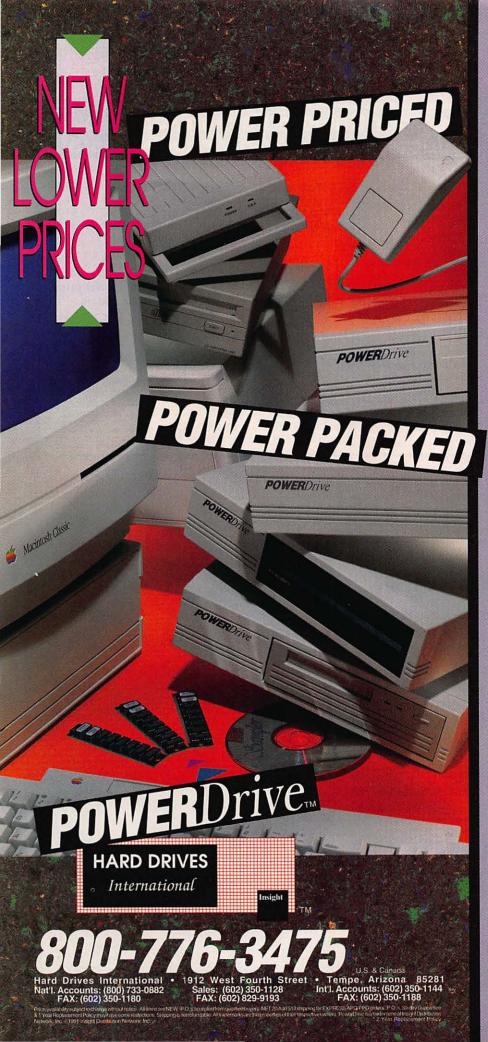
Extended Warranty Service for your Macintosh



As the fastest-growing direct reseller of Macintosh systems, peripherals and software, Mac and More can now double the warranty on your Mac system with membership in Club 24. Services include:

- · 24 month warranty on Apple products
- . 72 hour repair or replace turn around
- Shipping via FedEx included both ways

Want more details? Call 1-800-MAC-0052 now!



POWERDrive

Н	ARD	R	IVE	S
Mbytes	Mechanism	Access	Internal	External
42	Seagate	28 ^{ms}	\$219	\$249
52LPS	Quantum'	17	\$249	\$299
80	Maxtor	17	\$279	\$339
105 _{LPS}	Quantum'	16	\$349	\$399
210	Maxtor	15	\$639	\$689
210	Quantum'	16	§639	\$689
320₩	Maxtor	14	\$999	\$1049
320+	Micropolis	14	NA	\$1199
660₽	Micropolis	16	NA	\$1599
1050₽	Micropolis	14	NA	\$2299
1050₽	Seagate	14	NA	\$2299
1500₩	Micropolis	14	NA	\$2699

REMOVABLE HARD DISK

SyQuest 44Mb

25ms. Includes 45Mb cartridge. Extra Cartridge ³⁷⁵ SyQuest 88Mb \$899

20ms. Includes 88Mb cartridge. Extra Cartridge \$129

OPTICAL STORAGE

CD/ROM

\$539

APE BACK

1.3Gb 4mm DAT \$1495

150Mb Teac

External. Includes tape & "Express Tape" software.

Extra 150Mb Tape

MEMORY

1Mb (1x8-80ns) 4Mb_(4x8-80ns)

\$39 \$199

\$549

\$49

POWERPRICED

- **NEW super low prices**
- We buy quality components in huge volume & pass the savings to you!

POWERPACKED

- Choice of brand name hard drives
 - Super FAST access time: 12ms 28ms
- 50,000+ hours MTBF
- Whisper-quiet fan
- 50-pin connectors to daisy-chain
 - Power surge protection
- Steel case for low heat & support

POWERDrives

- By the experts at HDI, since 1987
- Compatible with ALL Mac Systems
- Toll-free technical support
- Step-by-step Manual included
- 30-day "Worry-Free" Guarantee
- 1 & 2 Year Replacement Policies





800 766-2313 MacsNOW **USA & Canada**

For fast quotes, fax your request to (512) 250-0217. We welcome foreign orders.

For the Best Price on your Custom Package or on over 3000 Macintosh Products, call our knowledgeable staff.

All systems are ready to run, including Mouse, SuperDrive, HyperCard, 5-1.44mb Diskettes with case, Mouse Pad, 6 Outlet Spike & Noise Supressor, Game, Utility, Educational, Business, Graphic and Virus Protection Software!

Mac Classic

2 megabytes of RAM, 40 megabyte
Hard Drive system\$1,149
4/105 System\$1,449

Mac LC

2 megabytes of RAM, 40 megabyte Hard Drive, Extended Keyboard, 14" High Resolution Color Monitor.

System Price\$2,199 4/105 System\$2,499

Mac Ilci

5 megabytes of RAM, 105 megabyte Hard Drive, Extended Keyboard, 14" High Resolution Color Monitor.

System Price\$4,449 8/180 System\$4,899

Mac IIsi

3 megabytes of RAM, 40 megabyte Hard Drive, Extended Keyboard, 14" High Resolution Color Monitor.

System Price	\$3,199
3/105 System	\$3,369
5/105 System	
9/105 System	The second secon

Mac IIfx

4 megabytes of RAM, 105 megabyte Hard Drive, Extended Keyboard, 24 bit Video, 14" High Resolution Color Monitor.

System Price	\$6,299
8/180 System	
32/1600 Syste	

Monitors

\$349 \$555

Call

\$949

14" Color Monitor	
Seiko 14" Trinrtron	
Full Page Monitor	
2 Page Monitor	

Call For the Best Price on Radius and RasterOps **Video Products**

8 bit 16" Color System \$1,549 24 bit 16" Color System \$2,199 8 bit 20" Color System \$2,399 24 bit 20" Color System \$3,099

Miscellaneous

LC Coprocessor	\$125
LC VRAM	\$99
40mb External Drive	\$199
Zoom v.42bis	\$175
Zoom v.32 Turbo	\$449
	1,425
Wacom Graphics Tablets	Call

Printers	
LaserWriter LS	\$919
QMS PS410	\$1,899
TI MicroLaser/PS17	\$1,289
TI MicroLaser/PS35	\$1,589
NEC SilentWriter II	\$1,559

Call 800 766-2313 for Free Technical Support.

If you find a lower price, Please call us.

Open 7 days a week

8am - 9pm CST Weekdays 10am - 5pm CST Weekends

MacsNOW

7913 Parliament Place Austin, Texas 78759 (512) 250-9511 FAX (512) 250-0217

Terms: Cashiers check, wire transfers, Visa & MasterCard accepted with no surcharge. Returns require an RMA # and are subject to a restocking fee. Prices do not include shipping and are subject to change without notice. Software is not returnable.

YOU WANTED YOUR MAC YESTERDAY.....CALL MacsNOW TODAY! MOST SYSTEMS SHIPPED SAME DAY

Circle 171 on reader service card.

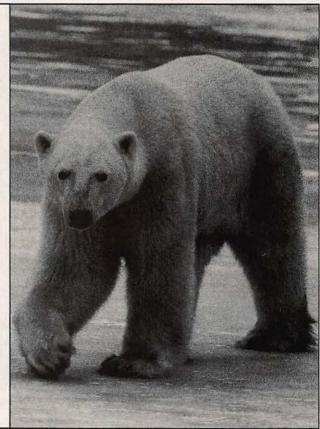
No Wild, No Wildlife.

Polar bears, musk-ox, grizzlies, caribou — more animals than you'd find in Yellowstone — can be found on the magnificent coastal plain of the Arctic Refuge in Alaska. Unfortunately, this portion of our last arctic wilderness has caught the eve of the oil industry. Right now Congress is considering proposals that would allow the oil companies to drill there, even though reports indicate there's less than a one-in-five chance oil would be found.

If we allowed drilling in the region, we would jeopardize the culture of the native Alaskans and untold wildlife, including a herd of 180,000 caribou. Our last arctic wilderness would be despoiled.

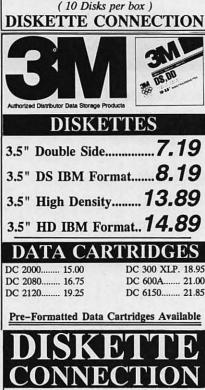
The Sierra Club works to save wildlife by saving the wilderness. We have a history of victories. And we believe with your help, this arctic wilderness will remain an invaluable refuge.

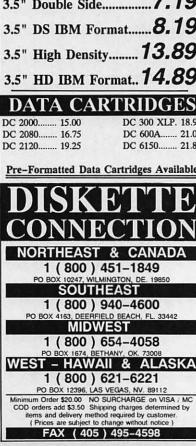
For information on how you can help:



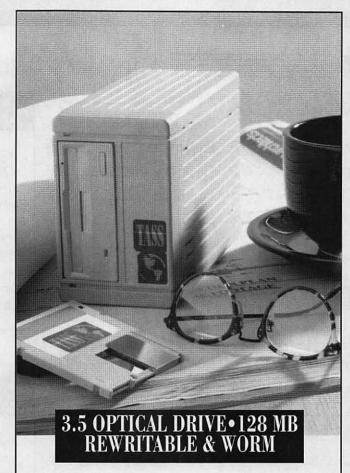
SIERRA CLUB, DEPT. AR, 730 POLK STREET, SAN FRANCISCO, CA 94109, (415) 776-2211







Circle 79 on reader service card.



TASS Optical World presents a new innovation in Optical Drive Technology. A faster, inexpensive way to retain and store all your data. With the new 3.5 MF, a revolutionary new drive with all the performance of larger drives, but, half the size - weight - and speed. ANSI & ISO compliancy.

5 GIGABYTES

With the new 5.25 LS (Library System) you can store up to 5 Gigabytes of information on an easy removable cartridge library system. Incorporating embedded SCSI, ANSI & ISO compliancy. Desktop storage never looked or stored better!

650MB • 1GB • 10GBJUKEBOX • 3.7GBJUKEBOXES TASS Optical World has the unit for you, for all your optical needs. Wether you need a 650 removable or a 1 Gigabyte removable, cartridges or any optical device.

FOR MORE INFORMATION AND PRICING CALL:619-558-8882

TASS OPTICAL WORLD

6730 Mesa Ridge Road. Suite B, San Diego. CA 92121

3.5 Optical • Quick Access STARTING AT \$1,795

Circle 211 on reader service card.



Hardware	Nutrition282
	Programming Tools 282
Bar Code271	Property Management 282
Computer Systems271	Public Domain282
Memory Upgrade274	Real Estate283
Peripherals 275	Sales/Marketing283
Printers 276	Scientific283
	Sign Making283
Software	Statistics283
	Training 283
Architecture276	
Astrology276	Services
Bar Code276	
Business276	Computer Insurance283
CAD/CAM277	Computer Repair283
Clip Art277	Data Conversion284
CD/ROM278	Data Recovery284
Communications279	Desktop Publishing284
Educational279	Laser Recharge284
Engineering279	
Entertainment280	Accessories
Fonts280	TROCCOS OTTES
Genealogy280	Diskettes284
Graphics	Furniture284
Graphics Translators 280	Mouse Pads285
HyperCard Stacks281	Supplies285
Import/Export281	
Languages281	Miscellaneous
Medical281	

.282

Clothing...

The Macworld Catalog Advertising Rates & Information

The Macworld Catalog section is a monthly link-up for buyers and sellers of Macintosh-related products and services. The Catalog offers advertisers a low-cost sales opportunity and provides readers with a timely, easy-to-use menu for product buying.

Display ads are sold by column inches (2" minimum). Standard red is available as a second color. Text-only listings are also available.

For more information on *The Macworld Catalog* call 800/888-8622.

The Macworld Catalog Advertising Sales Staff

Wendi Smith, Western Account Manager, 415/978-3117 Carol Johnstone, Eastern Account Manager, 415/978-3152 Beverly Schneider, Telemarketing Sales Manager

501 Second Street San Francisco, California 94107 800/888-8622

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.

286

Music/MIDI.....



Hardware

Bar Code

BAR CODE & MAGNETIC STRIPE READERS FOR MACINTOSH PLUS, SE & II

Connects on keyboard or ADB Requires no additional program or port Does not affect keyboard or mouse Industrial quality, heavy-duty units Also available

SmartCard encoder/reader Magnetic encoder
Code 39 UPC & Printing Software Portable Bar Code Reader

TPS Electronics 4047 Transport Street Palo Alto, CA 94303 415-856-6833 800-526-5920 Telex: (Graphnet) 371 9097 FAX: 415-856-3843

CIRCLE 441 ON READER SERVICE CARD

BAR CODE READERS

- For all Macintosh models.
- Attaches as second keyboard.
- 2of5, UPC/EAN, 128, MSI, Code 39.

- Magstripe, laser, or wand input.
 Complete with wand \$399
 64K Portable with wand \$849
 2 yr warranty. Immediate delivery.
- 30 day money back guarantee.

800-345-4220

417 Ingalls Street . Santa Cruz, CA 95060

VORTHINGTON

DATA SOLUTIONS

Computer Systems



- INTERNATIONAL
- Canadian Domestic Warranty
- Same Day Repair/Replace •
 1000's of Repeat Customers in 4 Yrs No Customs Hassles
- Guaranteed Best Prices in Canada · All Major Hardware, Software ·
- Two Full-Service Stores in Toronto (416)466-8107 • (416)785-8887

1-800-668-2037

CIRCLE 426 ON READER SERVICE CARD

Computer Systems

1-800-334-KIWI

Mac Classic 2/40mb...\$1199 Mac Classic 4/105mb.\$1549 Mac LC 2/40mb with 14" color monitor \$2149 Mac LC 4/105mb with 14" color monitor.....\$2499 Mac IIsi 3/40mb......\$2599 Mac IIsi 5/105mb......\$2999 Mac IIci 5/105mb......\$3899 Mac IIci 5/170mb.....\$4199 Imagewriter II.....\$425 Apple Stylewriter.....\$435 H.P. Deskwriter.....\$499 Personal Laser LS......\$899 Personal Laser NT.....\$1799 Keyboard & monitor not included in Ilsi,ci & fx price All items new. 1 year warranty.

Most items in stock today. Visa & Mastercard add 2% C.O.D. orders accepted.

KIWI COMPUTERS

P.O. Box 67381 Los Angeles CA 90067 US & Canada (800)334-5494

International (213)553-4507 Fax (213)286-9667

Mon-Fri 8.30am-4.30pm PST

CIRCLE 404 ON READER SERVICE CARD

New RackMacs™

Macintosh LC and 13" RGB Monitor in one 19 inch rack-mounted NEMA 12 package. Ideal for operator control stations.

Industrial grade Mac IIx, IIfx, and now IIci available with matching industrial touchscreen display and rack-mounted keyboard/mouse drawer. For vehicle, medical, laboratory, automated test, process control and operator entry applications.



GreenSpring Computers Inc.

1204 O'Brien Dr. Menlo Park, CA 94025 415-327-1200

CIRCLE 519 ON READER SERVICE CARD

Computer Systems



COMPUTERS & SOFTWARE

Mac Plus / Mac Classic \$599 / \$739 Mac SE 20-1 / Mac SE 40-2.. \$899 / \$1199 SE 30 40-2 / SE 30 80-4..... \$1799 / \$2249 Mac IIcx 40-2 / Mac II 40-2.. \$2499 / \$1999 Mac IIx 40-2 / Portable 40-1\$2499 / \$2199 Mac IIci 80-5 / Mac IIfx 80-4\$3499 / \$4699 LaserWriter II NT / NTX \$2199 / \$2799 LW Plus / Colorscript 100 \$1399 / \$3999

We Buy & Sell Any Quantity Of Macs And Accessories! Lowest Prices Guaranteed !!

(408) 973-1483

CIRCLE 493 ON READER SERVICE CARD

Great Mac Buys

Computers

Mac Plus	\$595
Mac Plus 1/40 HD†	\$995
Mac Plus 2.5/40 HD†	\$1095
SE Duo	\$895
SE 1/20	\$1095
SE 2.5/20	\$1195
SE 1/20 FDHD	\$1195
Mac II 1/40	\$2295
Mac II 4/40	\$2445
Lisa/1Mb RAM/800I	ζ.
20Mb SCSI HD	\$595

Lisa works like Mac Plus! †Includes a new internal 40Mb SCSI hard drive

30-Day Money-

Back Guarantee

Hard Drives

	7 87 85 7.7 St
Sun SCSI 20 Ext.	\$249
Sun SCSI 40 Ext.	\$395
External SCSI case	only \$99
400K ext (used)	\$39
400K ext. (new)	\$59
800K ext. (new)	\$169
Printers	

Olympia NP60 (new) \$329 ImageWriter // \$349 Seikosha 2000 AP (new) \$249 Printers are ImageWriter comp

Our free catalog has it all.

Reconditioned

Modems

Star 2400 Baud (new) Avatex 1200 Baud \$79 Modems include cable and software.

Soltware	
MS Works v2.0 (new)	\$129
BPI Entry Series	\$19
Business Filevision	\$25
Focal Point	\$19
MacNET	\$19

Much More ...

Cables • Accessories Repair Parts • Manuals

90-Day Parts &

Labor Warranty



Call for FREE catalog 24 hrs. a day.

Sun Remarketing, Inc. P.O. Box 4059 — Logan, Utah 84321 — Fax:801/755-3311

CIRCLE 424 ON READER SERVICE CARD

Continued...



Computer Systems

BUY, SELL OR TRADE YOUR MAC
Save 50% to 60% from New Prices!

19° Color Tengtron Monitor w/24-bit 75 Hz Card
S2895
Ouantum LPS 105mb Internal Hard Drive
S639
Ouantum 210mb Internal Hard Drive
S639
HP Desk Writer
S495
670mb Maswire
S1505 670mb Maxsto MacBottom 52mb External Hard Drive Used Mac SE30 2/40 S1995 w/ext kbd New Classic 2/52 S1195 Call us before you sall your used Mac No Quantity Too Small or Large
CALL 800-MAC N TOWN or 201-224-4273
International Orders - FAX 201-224-6449

CIRCLE 574 ON READER SERVICE CARD



Your #1 Export Source for Macintosh! Mac Classic 2/40 \$1289 • Mac LC: 2/40 \$1749-4/80 \$2199 MacIl si: 3/40HD \$2599 • 5/80HD \$3149 •Nubus Card \$179 MacIlat: 5/Mbr1.44.\$3499; 8/105HD.\$4399 Macil In: 4mb/1.44 5/39499* 6/10sHD:54099* 4/2(HDE) 53799 Macil In: 4mb/1.44 547994/10sHD 55199*8/210HD 55749 Microtek 6002S \$1449*Abaton-LaserScript \$1599* InterFax \$309 Raster Ops 24L/19* 55299* E-Machine T-16 24/XL \$5699 Megamt/Trintron: CT 20* TGB: 8bit 52499*24bit \$3399 OMS PS 410 \$1849*Apple 13* RGB \$679*Radius Pivot \$799 Why Buy from Mac One? Here's Why!

Mac-Knowledgeable & Personalized Service Since 1987 Mac-Knowledgeable & Personalized Services Since 19
 Safe & Reliable Worldwide Delivery-48 Hours to Europe!
 We Specialize in Exporting- our competitors DON'T!
 Our New York Location + Experience= Great Deals!
 We Stock what we sell, we are NOT 'Computer Brokers'
 Foreign Orders110/220 'Our Specialty.Fax Us!
 No Sales Tax Due On Sales Outside New York State
 Bealers & Consultants Welcome Quantity Discounts

U.S. Sales Line Open: Monday -Friday 10am -Spm EST N.

Fax Line: Open 24 Hours

CIRCLE 410 ON READER SERVICE CARD



upgrade \$2299. arts/Systems

full-page \$399.up

Systems

We BUY Systems

Call for catalog!

318-742-2799

CIRCLE 425 ON READER SERVICE CARD

Call Jim or Penny

We Take Trade-ins.
Trade-in your Old Computers
for New Systems.

We do Upgrades. Upgrade your XT to a 386. Add Memory or Speed to your Mac Hard Drives

1317 E. Edinger Santa Ana, CA 92705 Santa Ana, CA 900/347-3423 714/558-8822 • 800/347-3423 Fax 714/558-1603 Established 1976

Computer Systems

MAC CLASSIC 2/401199
MAC LC 2/401700
MAC LC 4/801949
MAC LC 4/1052049
MAC IISI 3/402575
MAC IISI 5/802949
MAC IISI 5/1203049
MAC SE 30 2/402299
MAC SE 30 4/802599
MAC IICI 4MB 1DR3400
MAC IICI 4/1203899
MAC IIFX 4/1205299
NEW MAC PORTABLE 2/40 CALL
PERSONAL LS/NT 899/1729
LASERWRITER IINT2685
LASERWRITER IINTX
HP DESKWRITER479
NEW APPLE STYLEWRITER 429
APPLE PORTRAIT MONITOR 749
SUPER MAC 8.24 PDQ IN STOCK
14" VGA COLOR FOR MAC 349
EXTENDED KEYB. FOR MAC 122
G.C.C PLP II849
G.C.C BLP ELITE1399
SONY 1304569
RADIUS PIVOT FOR MAC IISI 729
RADIUS COLOR PIVOT1299
WE ONLY SELL

WE ONLY SELL **BRAND NEW COMPUTERS**



(213) 473-2535 • Fax (213) 473-5236

NO CREDIT CARDS PLEASE

CIRCLE 427 ON READER SERVICE CARD

Access II

Computer Systems



Best Prices, Service, Delivery

Mac Classic & Keyboard	925
Mac LC 2/40 & Keyboard	1775
Mac IICX 5/105	2985
Mac IISI 5/80	Call
Mac IICI 5/105	3975
Mac IIFX 4/105	5395
Mac IIFX 8/345	6695
RasterOps 2pg BW & card	1085
Radius Trinitron & 24bit	5650
Ikegami 20" color & 24bit	3695
SuperMac w/24bit PDQ	5650
Apple Personal L/W NT	1799
QMS PS-410 w/toner	1985
QMS color 100 model 10	6695
LaserMax 1000/1200	Call
Abaton Laserscript LX	1885
NewGen PS400/800 3799/	5450
Microtek 300ZS/600	Call
Sharp JX-450 w/GPIB	4585
Color Laser Ptrs, DayStar E	Brds,
Mac IIs, SE/30s, 2GSs avail	lable

DEALERS AND INTERNATIONAL SALES WELCOME. We won't be undersold! Call or fax now for best quote

CENTER TEL 213-470-9555 FAX 213-470-9457 2253 Wertwood Bird lor Angeler, CA 90064

CIRCLE 508 ON READER SERVICE CARD

WE BUY YOUR USED MAC EQUIPMENT FOR TOP DOLLAR, CASH! WE SELL REFURBISHED MAC'S AT DISCOUNT! CALL FOR QUOTE. RENTEX INC. (800) 545-2313, (617) 423-5567

CIRCLE 521 ON READER SERVICE CARD

Used Mac Equipment

26 Keewaydin Drive Salem, NH 03079 1 (800) 662-5606

CIRCLE 469 ON READER SERVICE CARD



Computer Systems



CIRCLE 401 ON READER SERVICE CARD

MAC CLASSIC 2/40	1199
MAC LC 2/40	1699
MAC LC 4/80	2045
MAC SI 3/40	2569
MAC SI 5/80	2999
MAC CI 5/80	3829
MAC FX 5/105	5240
MAC PORT 4/40	3399
PERSONAL LS/NT	899/1725
LASER WRITER NT	2635
LASER WRITER NTX	3295
HP DESK WRITER	499
NEW STYLE WRITER	435
RADIOUS FOR MAC II SI	735
MAC PORTRIT MONITOR	739

PARS COMPUTER CENTER TEL(213)859-0225 FAX(213)859-0407

CIRCLE 411 ON READER SERVICE CARD

Computer Systems



CANADIAN DELIVERY

Buy Anything In This Magazine! We Clear Customs & Deliver Cheaper Than You Could!

(800) 461-0600

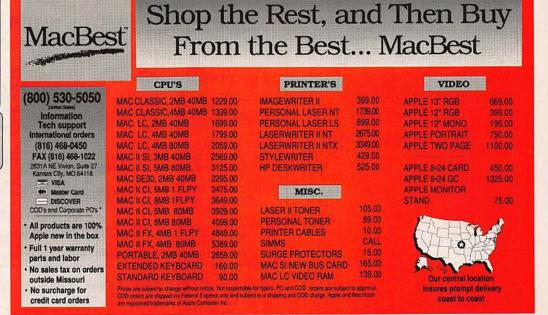
Fax: (416) 875-0135

CIRCLE 588 ON READER SERVICE CARD



CIRCLE 457 ON READER SERVICE CARD

Computer Systems



CIRCLE 569 ON READER SERVICE CARD

Continued...



Computer Systems

Memory Upgrade

WACO, TX 76706

CPU's (Se. Se30, Si, Lc, II, Cx, X, Ci, Fx) Apple Laser Writer Plus, IInt, Ntx Apple Color & Monochrome Apple Scanner 300dpi 16 GS Sharp JX450 11x17 24-bit scanner HP Scan-Jet 400dpi 16 GS Quark 2.1 \$30 Upgrade to 3.0

We Buy and Sell New and **Used Systems Any** Quantity

Call us for a quote on your mac		ac
Call	Sigma L-View mono 19" w/card	\$1295
Call	Dest Flatbed scanner w/sheetfeeder	\$1495
Call	Rodime 140 meg HD	\$695
\$1095	Mitsubishi 16" color w/card	\$1595
\$3995	Sony 13", 14", 19" Trinatron	Call
\$795	RasterOps and Radius	Call
\$395	Call for Software List	Call

(817) 754-2120

(817) 754-2345 fax University And Corporate PO'S Welcome

CIRCLE 499 ON READER SERVICE CARD

OWEST PRICES ON MEMORY!

Lifetime Warranty • Overnight Shipping \$8•

1, 2 & 4 MEG SIMMs Mac Portable Ram **HP Laseriet Boards** Mac Classic Boards Video Ram Upgrades Mac IIci Cache Cards

Syquest Cartridges Mac LC Video RAM Mac LC 68882 math chip

UPGRADES 512Ke - Plus \$295 128K - Plus \$575

Peripheral Outlet • (800) 332-6581

314 S. Broadway • Ada, OK 74820 • 405-332-6581 • Fax 405-436-2245

CIRCLE 454 ON READER SERVICE CARD

Memory Upgrade

MEMORY 🚀 "Don't pay retail...buy direct"

Accelerators for your Mac

	MAC II, IIX, IICX	W/ 68882 Math Chip
25Mhz	\$1139	\$1295
33Mhz	\$1295	\$1519
40Mhz	\$1449	\$1695
50Mhz	\$1995	\$2306
	CACHE CARDS	FOR IICI:

82 Math Chip \$259 **FastCache** w/40Mhz \$979 \$1195 w/50Mhz \$1789 \$2049 FOR NUBUS:

SCSI power Card - \$1149. 0-25 Meg RAM Power Card - \$769.

SUPERMAC

ACCELERATED CRAPHIC CARDS

ACCELERATED GRAFIIC CAP	LD3
Spectrum/8•24 PDQ	\$1029
Spectrum/8•24 PDQ SI	\$1029
Spectrum/24 PDQ w/ display calibrator	\$2159
GRAPHIC CARDS	
Spectrum/8 SI	\$729
Spectrum/8 SerIII	\$729
DISPLAYS	
21" 2 page color	\$3219
19" Supermatch Color	\$2049
19" Dual Mode Trinitron	\$3069
19" Platinum	\$1029

MEMORY

Memory Upgrades for your Macintosh

MAC CLASSIC 1 MEG BOARD -\$89. • 2 MEG KIT -\$88.

MAC PORTABLE 1 MEG KIT -\$199. • 2 MEG KIT-\$499. 3 MEG KIT -\$749. • 4 MEG KIT-\$949.

MAC II/SI

2 MEG KIT -\$89. • 4 MEG KIT -\$176. 8 MEG KIT -\$420. • 16MEG KIT -\$740.

MAC +, SE , SE 30*, LC* 2 MEG KIT -\$89. • 4 MEG KIT -\$176. 8 MEG KIT*-\$344.

MAC II, IIX, IICX, IICI 4 MEG KIT -\$176. • 8 MEG KIT -\$344. 16 MEG KIT -\$740. • 32 MEG KIT -\$1330.

MAC FX &LASERWRITER II NTX 4 MEG KIT -\$199. • 16 MEG KIT -\$809. 32 MEG KIT-\$1599.

P.O.s accepted for: Fortune 1000 • Government • Educational Institutions

HARD DISKS

		THE PROPERTY OF THE PARTY OF TH	
	QUANTUM 52MB 105MB 120MB 210MB	Internal \$259 \$469 \$629 \$785	\$339 \$539 \$699 \$845
	MAXTOR 340MB 760MB 1.2Gig	\$1439 \$1699 \$2739	\$1539 \$1859 \$2959

SYQUEST 45MB Removable with Cartridge

\$459!

NETWORK PRODUCTS

NuBus Adaptors (MAC II, IIx, IIcx Mac Con +II ET (Thick & 10 BaseT)	\$289
with 64K	\$319
PDS Adaptor (Mac IIsi, & SE 30)	
Mac Con + 30i ET (Thick & 10 BaseT)	\$289
with 64K	\$319
Adaptor For Mac II LC	
Mac Con + LC	\$289
Friendly Net (supports Apple Cabling Sy	rs.) \$279

Asante 10T Hub (14 ports)

\$799

Lifetime Warranty Free tool included Same Day Shipping 1-800-486-CHIP (2447)







Prices subject to change

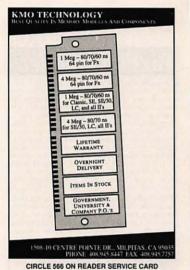
CIRCLE 516 ON READER SERVICE CARD



Memory Upgrade



CIRCLE 573 ON READER SERVICE CARD





(510) 548-0130 CIRCLE 462 ON READER SERVICE CARD

1767 Morning Glory Road

Peripherals



- A quality source of your external SCSI hard disks, tape backups, and combo units. Apple, Mac, IBM compatible.
- An exclusive manufacturer of all FIRST CLASS PERIPHERAL SIDERS. Also provide service, repair, and upgrade on existing models.
- See our AD in the upcoming issues of this magazine.

1700 Forrest Way Carson City, NV 89706 Sales: 800-982-3232 Tech Spt: 702-687-2800

. PLEASE MENTION THIS AD . HARD / TAPE / CDROM / OPTICAL

CIRCLE 564 ON READER SERVICE CARD

Toll Free (800) 622-6

Canada (800) 833-6698 Bay Area (415) 623-8890 48860 Milmont Dr., 103C Fremont, CA 94538

RasterOps 24Si 24 Bit for all Mac II 579 RasterOps 264/30 24 Bit for SE/30 579 \$ RasterOps 364 24 Bit Frame Grabber \$ 699 RasterOps 24L Trini. Sys. (70 demos) \$3995 RasterOps Grayscale 430/440 \$1399 RasterOps Business System 8 Bit \$2399 NEC MacSync HC 14" Color Monitor \$ 449 E-Machines T-16 16" 8 Bit System \$1895 E-Machines T-16 XL24 24 Bit Accel. \$2695 E-Machines E-16 for LC, ci. si \$ 995



Peripherals

AUTHORIZED RasterOps AND E-MACHINES DEALER

CIRCLE 438 ON READER SERVICE CARD

The Best Products, Prices and Service from 1-800-626-1889



24s or 24si 24XLTV Video Color Board 8XL 19" or 21" Hitachi Sys. 8XLi 19" or 21" Hitachi Sys. 24XLi 19" or 21" Hitachi Sys. ClearVue/GSXL 19" or 21" Sys. ClearVue/GS30 19" Sys.

ColorBoard 264/SE30 Business Color System SE/30

Infinity 40 Removable Infinity 88 Removable

CD-ROM / Infinity 40 Twin **OuickSCSI** Accelerator Card

Specials

\$395 / \$595

\$3295 SCSI PowerCard with 4 MB \$2495 / \$3595 RAM PowerCard with 8 MB

FastCache IIci SCSI PowerCard \$1065 \$1415

\$265

\$1415

\$395

\$595

\$45

\$925 / \$1135

\$1625 / \$1905

\$1345 / \$1835

PowerCache IIci 40MHz / w Math \$3445 / \$4545 PowerCache IIci 50MHz / w Math \$4745 / \$5845 \$1185 / 1495 PowerCard 030, 40 or 50 MHz \$1425 Illustrator 3.0

Photoshop 2.0 \$595 \$2395 Paracomp Swivel 3D Professional

Paracomp FilmMaker 2.0 \$995 MacroMind Director 3.0 \$1295

MacroMind MediaMaker \$425 1 MegaByte, 70 Nanosecond SIMMs

\$425 \$425 \$725 \$535

MacWorld • RasterOps 24STV Video Color Boards are in stock! · ViewSonic 5, 14" Multisync Trinitron Monitor

\$1175

We are Authorized Dealers for all of the products we carry. All of our products are NEW. Business Leasing is available

6113 South 380 West, Salt Lake City, Utah 84107 (801) 265-8882

CIRCLE 541 ON READER SERVICE CARD

Continued...



Peripherals

Made in U.S.A.! Fully Hayes*-compatible with cables, software &

V.42bis data comp./error correction 2 yr. warranty See Jan. '91 MacUser for great review! (4	\$169
Sendfax 2400 bps data; 7 yr. warranty	from \$99
Send/Receive Fax 7 yr. warranty	\$139
V.32 Turbo Up to 38,400 bps! 2 yr. warranty	\$449
Mac Classic 4/80 Get more for less!	\$1390

Mac Systems & Peripherals at Competitive Prices

CIRCLE 593 ON READER SERVICE CARD

Software

Architecture

DESIGN YOUR OWN HOME



Retail Price Per Program Apple II/Laser 128, 64K . . .

Macintosh, 1MB To order or receive a free color

catalog call 1-800-451-4871

CIRCLE 530 ON READER SERVICE CARD

Bar Code

BAR CODE FONTS



· Generate film masters

· Runs on Dot Matrix, Laser, or Lino

\$199.00 for Code 39 or UPC/EAN

Bar Code Readers from \$399.00

30 day money back guarantee

800-345-4220

417 Ingalls Street . Santa Cruz, CA 95060

WORTHINGTON

DATA SOLUTIONS

MAC TIME

800-488-0746

EPSON EPL-7500 NEC MOD 90 1539 NEC MULTISYNC 3DS 629 QMS PS 410 1899 QMS PS 815/825 3499 / 4299 T.I. PS 17 / 17 XL 1279 / 2295 T.I. PS 35 / 35 XL 1549 / 2595 **EPSON SCANNER ES-300C**

1599 37 S Third St. DEALER INQUIRIES INVITED Oxford, PA 19363

CIRCLE 575 ON READER SERVICE CARD

Astrology

MCHOROSCOPE Be your own astrologer,

for fun or profit. Produce amazing astrological reports for friends and family. \$199.50

"McHoroscope" (Chart Interpreter) produces beautiful natal charts plus 15- to 17-page interpretations. Professional astrologers charge \$50.00 and more for similar reports. Excellent study guide for students and great fun for parties and get-togethers.

·Astrology for the Macintosh from Time Cycles Research

· Write or call for free brochure ·

Time Cycles Research 27 Dimmock Rd Waterford, CT 06385 MC•Visa•Amex (203) 444-6641

CIRCLE 447 ON READER SERVICE CARD

Business

Organize your ideas, coordinate your pla vince others to support you. Intuitive, lo ness & marketing plan template on diskette for launching a new product, service, or company. 904 pages of outlines, headlines, written texts, tables, formatted into 33 MacWrite™ & MSWord™ files.

Follow tutorials, fill in the blanks, edit into a finished plan. 126-page reference includes important info about getting money from banks, the SBA, investors. Integrated financial worksheets in Excel (SYLK) are preformatted: includes detailed Budget, Income Statement, Balance Sheet, Cashflow Projection, Brank Expan Analysic, David work box tion, Break-Even Analysis. Dazzle your boss, banker or investors. 37,000+ sold! v 4.0 \$129+s/h

BizPlanBuilder could be exactly what the busi ness doctor ordered... I don't often see credible literature, but in this case, I am a believer. You owe it to yourself and your company to own and use BizPlanBuilder." — Leon Wortman, Software Editor, Business Marketing

New!

✓ Type 1

Version 3

PostScript ✓ UPC/EAN

Supplements

V UPC/EAN

Bar-Width

Reduction

✓ Font Utility DA

Leverage Your Time & Macintosh 8 800/ 346-5426 toll-free 415/941-9191 worldwide

MC•Visa•Amex 30-Day Guarantee

CIRCLE 439 ON READER SERVICE CARD

Macworld

Printers

Multipart Forms on all MAC's Apple Daisywheel Printer for crisp text and 10-part forms on any Mac. Fast 40 char/sec. Fixed & proportional fonts (with legal, foreign & math symbols), auto boldface, underline, subscripts. Up to 15" wide paper & 198 columns. NEW \$449, RECON. \$349 incl. easy point & click printer resource, ribbon, printwheel, I/F cable. New sheetfeeder \$49, tractor \$129. High commercial quality & looks. 90 day guarantee. Quality Discount Computers, Inc. 135 Artist View Dr. Wellington, NV 89444

415/487-8148 800/472-7444

Bar Code



Bar Code

 Code 39 • UPC/EAN • Interleaved 2 of 5 • PostNET prints on ImageWriter, LaserWriter, Imagesetters . Bar code readers starting at \$395.

916-622-4640 916-622-4775 "Easy to use ... we love 'em!" - D.C.,

Digital Audio Disc, Div. of Sony

BearRock

6069 Enterprise Drive . Diamond Springs, CA 95619

Magazine.

When you get down to business, you can't do without it.



Business

Powerful Business Plan Software

- software for the Mac
- **Expert Narrative describes** your business at its best Sophisticated Financial
- Forecasts build credibility · Create your Business Plan and/or earn excellent profits creating Business Plans for
 - other entrepreneurs as a **Business Plan Consultant**

MAC System 6.05 or later, 2MGs RAM, withlard Drive, VISA MASTERCARD include number and

signature MO residents add \$5.72 sales tax



Did you know...

Macworld is the only

Macintosh specific

magazine growing

Macintosh installed

12/89 - 12/90*

circulation grew

16.1% during the

BPA ConsumerTrac, December 1990

same period.**

IDC, July 1990

Macworld's

base grew 20.8% from

with the market?

Launching or expanding a business can mean exciting profits. Bankers and investors now require a professional
Business Plan. PLANMaker
takes you step by step, page by
page, from Executive Summary
through Financial Forecasts.
Easy entry boxes and an
extended selection of namative makes customizing easy. All calculation and formatting are automatic with PLANMaker. Requires no other software.

\$99,+\$3 Delivery (Reg\$129) Introductory Offer—Superb Value

Call Write for Brochure or order 1-800 955 3337

Clip Art



Images. Ancient to Modern Designs Paint format. 500 ILLUSTRATIONS and 140 BORDERS on 3 DISKS! Includes Artisto+ DA. Prompt Delivery. Check, PO.

Ordering & Information: (505) 982-1562 1-800-245-7824

RT GRAPHICS 2257 Calle Cacique, Santa Fe, NM 87505

CIRCLE 458 ON READER SERVICE CARD

Clip Art



CIRCLE 554 ON READER SERVICE CARD

CIRCLE 586 ON READER SERVICE CARD

CAD/CAM

Professional **CAD Symbol Library**

PLANMaker

1920 S Broadway Dept 1 - St. Louis, MO 63104

1-314-421 0668

Same day shipping



Architectural (Residential & Commercial), Interior Design & Site Planning, The "Plumbing & Heating Supply House", The "Hardware Store", The "Electronics Shack", Welding, General Drawing Aids, Cartographic, 180+ Page User's Manual, And Much More, All for

Advanced System Design, Inc. 1010 Stagecoach Blvd., P.O. Box 3131 Evergreen, Colorado 80439 (303) 674-2222 to Order

Compatible with MacDraw II™ PowerDraw™ and

CIRCLE 408 ON READER SERVICE CARD

MILITARY CLIP ART





314-365-4146

Storm King Technology One Imperial Ct . Lake Ozark, MO 65049

Hundreds of images of US and foreign military equipment and US insignia. Professional quality for illustrations, publications and presentations. Best variety. Best quality. Best value.

CIRCLE 501 ON READER SERVICE CARD

FREE CLIP ART 50+ OF OUR BEST IMAGES

TRY US! Get 50+ of our best selling images - FREE Credit Cards only

PAY ONLY \$5.00 SHIPPING

SMC SOFTWARE PUBLISHERS 619 931-8111

CIRCLE 570 ON READER SERVICE CARD

PICT, Paint World

Professional Quality Maps for Desktop Publishing and Graphic Design

For Your FREE Brochure

800-334-4291

MicroMaps Software • PO Box 757 • Lambertvi 609-397-1611 • Fax 609-397-5724

CIRCLE 417 ON READER SERVICE CARD

Clip Art

CLIP ART FOR ADVERTISING





LOGOS & TRADEMARKS, 1, 2, 3, 4 & 5 S99EA

INT'L SYMBOLS & ICONS, 1 & 2 S99EA

FLAGS OF THE WORLD 599 VINYL CUTTER'S COLLECTION \$199

BUSINESS SYMBOLS 599

800 255-0562 Innovation Advertising & Design



41 Mansfield Avenue • Essex Junction, VT 05452

CIRCLE 579 ON READER SERVICE CARD



BUY ANY DRIVE AND SAVE UP TO \$1000 ON SOFTWARE!

\$750 worth of software for only \$199!

Buy all 4 CDs below with the purchase of any CD-ROM drive for 4 only \$199, #1599, Limited time.

. The Illustrated

Encyclopedia 21 volumes. Over 1500 color and black and white pictures. A retail value of \$395.

2. World Atlas 240+ detailed color maps, and a huge database of international information. A retail value of \$79.95.

3. Time Tables of Science and Innovation Over 6000 stories. A retail

value of \$129.

4. The Whole Earth Catalog More than 3500 entries on a vast array of subjects. A retail value of \$149.

NEC Desktop Publishing CD-ROM Drive Bundles

NEC Intersect CDR-73 & Type Gallery PS #B1978, \$729. Save \$219.95.

NEC Intersect CDR-73 with Type Gallery PS, Clip Art 3D, & Image Gallery #C1978, \$1200. Save \$288.85.

NEC Intersect CDR-36 & Type Gallery PS #B1977, \$479. Save \$269.95.

CD-ROM DRIVES

1981	CD-Technology Porta Drive \$599
	325ms/64K buffer
1937	Toshiba XM3301: 325ms/64K buffer 699
1391	Toshiha XM3201: 350ms/64K buffer 679

FAUGARP THE FIRST AND BEST NAME IN

Toll free in the U.S. and Canada

699

1978 1977	Chinon CDA-431: 350ms/32K buffer579 NEC CDR-73: 300ms/64K buffer679 NEC CDR-36: 500ms/64K buffer479
	CD-ROM TITLES
Educ	ation
1603	Anatomist\$249.00
1610	A reference to explore the human anatomy. ClassRoom*
	Desert Storm33.00
1355	EcoDisk
9,	\$25.00 1543 Shakespeare25.00
V.	1541 Birds of America 25.00 1544 All 3: Classic Collection 65.00
1642	1544 All 3: Classic Collection 65.00
1635	The Family Doctor
1635 1605	The Family Doctor
1635 1605 1614	The Family Doctor
1635 1605	The Family Doctor
1635 1605 1614 1261 1204 1361	The Family Doctor
1635 1605 1614 1261 1204	The Family Doctor

1932 Chinon CDC-431.

Remote control. 350ms/32K buffer

	1601	PEMD Discovery	.149.	00
	1716	Queue "800" College Boards	149	00
	1713	Queue Educational Games	. 79	95
	1712	Queue A+ French Tutor		
	1715	Queue Mastering Math		
	1711	Queue A+ Spanish Tutor	249.	00
	1714	Queue Writing Skills	249	00
	1613	Study Room*	29.	95
	1310	Websters Talking Dictionary	.179.	95
		Every word is defined and pronounce	ed	
	Way	zata 2-CD Sets		
		World Fact Bk/Front Pge Nws	120.	00
	1597	All of MacTutor/DiscTracy	.199.	00
		ctop Publishing		
	1267	Artroom-ImageClub	440	05
	1606	Aquatic Art CD	140	05
	1023	200 sparkling images of marine life.		90
	1567	Classic Art Business v.1	3/10	nn
	1330	Clip Art CD		95
	1389	Desktop Publishing CD	70	05
	1621	Full-Page Images	379	nn
	1606	Grafix: 2000 pictures	449	nn
	1338	Image Club Art & Typevendor.	59	95
	1581	Inter Granhics Library	299	nn
	1001	Inter. Graphics Library Over 200 business oriented color im	ages.	00
	1604	Letterpress Ocean Imagery: 100 color photo	2999.	00
	1585	Ocean Imagery: 100 color photo	s .99.	00
	1594	Photos On Disk	179.	95
	1342	Quick Art	189.	95
	1385	Right Images		
	1595	Swimsuit CD	199.	00
		Sports Illustrated move over! 200 p	hotos	of
		women in sexy swimwear.		
		WHITE IN THE REAL PROPERTY.	PIEE	
d	11 Th. 12 Co.		10000	

Sour	nds Effects/Music	
	Beethoven's 9th79.9	5
1383	Beethoven's String Quartet55.0	0
	Desktop Music Creativity Kit229.0	
	Grooves: Clip music99.0	
	Magic Flute: A 3-CD Set55.0	
1582	Sound/FX: 240 sound effects199.0	0
1609	Sound Machine*49.9	5
SPEC	CIAL! S1576 Voyager's Stravinsky:	
The F	Rite of Spring69.99	5

It's **really** here!



1		MOK-N
Mul	Itimedia	
1802	2 Alice In Blendoland	49.95
	Color Bckands: MultiMedia	
	Dictionary of the Living World	
	B Macworld Super Stacks	
158/	World of Travel -The Orient	220 00
	3 Verbum Interactive CD	
	1 Virtual Valerie	19.90
	cellaneous	
1390	CD-ROM Developers Lab	299.00
1300	EDUCORP CD-ROM 5.0	199.00
	\$50 off with purchase of any CD-RON	
	A 2-CD set, over 700 megs of Sharew	rare.
	7 Exotica-ROM 2.0	
	I GameRoom*: over 750 games	
1636	5 Impressionism-Coate's Art Revi	
	A comprehensive review	79.95
1637	7 Terrorist Group Profiles	59.95
	B Utility Room*: 75+megs of utilities	
	Voyager's CD Audio Toolkit	
* Ind	icates that software is contained on The UCORP CD-ROM 5.0.	



REWARES

800K DISKS AS LOW AS \$4.99 EACH!

Individual disks only \$6.99 each. Buy 5 for \$5.99 each, or buy 10+ for \$4.99 each.

4414 Compugraph

A fully working 3D graphics program. Control dynamic rotation and view designs from any perspective. Includes multiple undo and animation

2129 ResEdit 2.1/CICN Editor

Edit and manipulate all resources, from icons and dialog boxes to menus. Edit color icons.

2128 Essential INITs

Contains MacPassword Demo for security and virus protection, INIT CDEV to turn INITS on and off, SCSI Probe 3.0 shows which SCSI ports are in use and more.

4601 SoundMaster 1.6.4

Control all Mac sounds: startup, restart, shutdown, beep and more! This CDEV works with system 7.0.

4043 Startup Screens

29 terrific startup screens for a change of pace.

2122 Virus Stompers

7 virus utilities. This disk includes Disinfectant, which scans and removes most known viruses.

4271 Board Games

Backgammon, 3D checkers, Pente and 10 more great board games

4275 Strategy Games

Artillery, Mystery Box, Hex Puzzle, Chinese Puzzle, Maze 3D and more.

7204 Clip Art Stack

Over 490 high quality bitmapped clip art.

2149 Printing Stuff

Print disk labels, maintain a small mailing list, print address, return address on envelopes and more.

4049 Anatomical Clip Art

High quality bitmapped anatomical clip art

4270 Thinking Games

A crossword puzzle program, Color Gunshy, MasterGuess and 8 more games.

2155 Utilities v.38

8 great utilities. Heap Tool will allocate more RAM to your system file which helps prevent crashes.

4034 Clip Art Extravaganza

100 high quality bitmapped clip art 3431 Preschool Education

8 programs including a great dot-to-dot construc-tion set, fun math tutors and more!

4612 Speech Synthesis

This disk contains MacinTalk, the speech synthesis driver for the Macintosh, and much more

5 DISK SETS \$24.95

1151 Best of Games v.1 31 of our best games

1224 Best of EPS Clip Art

100 high resolution EPS picture

1155 Best of Education v.1

60 of our best educational programs 1709 Type 1 Fonts Set

40 Adobe Type Manager compatible type 1 fonts.

1705 Color Art Set

50 high resolution color pictures in Giffer format.



EDUCORP Computer Services

7434 Trade Street . San Diego, CA 92121 Orders: 800-843-9497 • Info: 619-536-9999 FAX: 619-536-2345



We'll meet or beat any advertised price on **CD-ROM** products!

CALL FOR A EREE CATALOG



Communications

TeleFinder[™]

Group Edition BBS
"the most useful BBS that we have seen" MacUser 7/90(UK). MultiUser, E-mail, file transfer, message threading, and icon interface. System 7 savvy. Starting at just \$375 for a 20 user pack.

- · NetConnectTM Hayes compatible "AppleTalk BBS" extension. \$149.95.
- · TeleFinder Pro icon interface terminal program with built-in mini host, scripting and ZMODEM. \$79.95.

Spider Island Software 4790 Irvine Blvd #105-347 Irvine, CA 92720 tel (714)669-9260

CIRCLE 576 ON READER SERVICE CARD

Educational

Grade Machine™

Gives you FAST full-screen editing of grades, weighted assignments & categories. Style sheets help customize reports. Each class file holds 250 students, 250 assignments, and 10 grading periods. Money-back guarantee. NOT copy-protected. Only \$74.95 + \$5.00 S & H. Reviewed 9/90 Macworld (p. 287)

Misty City Software, Dept. MW10 10921 129th Place N. E. Kirkland, WA 98033 (206) 828-3107

Educational

Riddler™

Riddler makes learning fun. Five colorful educational trivia games using text, graphics, and sounds entice the user to learn using one of the many available Quiz Files (4 of which are included). The optional Editor allows you to create custom Quiz Files. Riddler \$49.95, Riddler & Editor

Threshold Software 1921 Corporate Sq. Blvd. Slidell, LA 70458 504/649-0484

Teacher's Rollbook

tool! Grade averaging and reporting. New quick grade entry-full attendance records and totals- Records disciplinary actions- Class size reports- Up to 315 students per file- Remember birthdays & checked out items- Letters to parents ·Min. req. Mac 512KE, 2 drives ·Back to school special \$89!! Current Class Productions 22824 Berendo Ave. Torrance, CA 90502

A complete classroom management

Macの日本語は クオリタスにお任せください

213/326-4246

Resource! Qualitas Japanese your

MacKojien

The prestigious Japanese dictionary on CD. Features sound, color and graphics.

rStone

Japanese dictionary DA. Two versions: Japanese to English and English to Japanese.

SOLO Writer

The acclaimed word processor NISUS in Japanese. This program does it all - word processing, graphics and DTP. Superior macro and search/ replace functions and many unique WP features.

Call, fax or write for our 1991 catalog.



Qualitas Trading Company 6907 Norfolk Rd., Berkeley, CA 94705

Tel.: 415-848-8080 FAX: 415-848-8009

CIRCLE 436 ON READER SERVICE CARD

Educational

MakeTest®

best way I have seen to store and categorize test questions." Macworld 9/90

EPS School Administrator's Assistant

1989-90 Classroom Comp. Learning Software Award of Excellence. Store staff, pupil records, due process, emerg. proc., schedules. Print reports.

Bobbing GradeBook

Rated best in Features, Look & Feel, Performance, Value, Satisfaction, MacGuide 8/89

EPS Personal Mar.

Automatic schedules, reminders, notes, addresses, billing, calling.

EPS Records Management System

Store location, use of school business files. Sort by criteria.

MathMaker Fonts

Type roots, fractions, number lines, summations, and x-v grids as text! ATM-compatible.

EPS Teacher's Asst.

"lush HyperCard stacks-runs like a dream." Macworld 9/90

Money-back guarantee

Toll-free MOUNTAIN LAKE*

800-669-6574, Fax: 415-752-6506 • 298 4th Ave. #401, San Francisco, CA 94118

CIRCLE 478 ON READER SERVICE CARD

THE <u>ABSOLUTE BEST</u> IN TESTING!

LXR-TEST™ 4.1 is the most advanced and complete testing system available for your Mac!

- Item banking
 Test generation
 Scoring & analysis
 Paper & interactive
 - Character styling w/tabs
 Full graphic placement
 Database selection
- uatabase selection
 Compatible gradebooks
 Student mastery
 Spelling checks
- Highest rated software available in various editions to match your testing needs. Fully guaranteed! Pricing from \$149. For complete brochure & free preview disk; call, write, or fax:

Logic eXtension Resources 9651-C Business Center Drive Rancho Cucamonga, CA 91730 (714) 980-0046 Fax: (714) 987-8706

CIRCLE 407 ON READER SERVICE CARD

Engineering

surveying • civil structural engineering

LANDesign \$595 (modules extra) A coordinate geometry, surveying & deed plotting package, with modules available for data collectors, DXF and other export options.

FRAME mac™ \$595

A 2-D structural analysis program capable of solving beams, trusses and frames.

One-month money-back guarantee. Free support.

- Other Programs Available:
- oad design
- Road design Deed plotting
 Contour mapping Structural design
 Terrain modelling AISC & CISC Section Table

Tel: (416) 738-4601 Fax: (416) 738-5207 COMPUneering 113 McCabe Crescent Thornhill, Ontario



CIRCLE 503 ON READER SERVICE CARD

"I saw it in Macworld!"

Engineering

Printed Circuit Board Design.

Protel's professional PCB design systems conform fully to Mac* buman interface guidelines yet protide all the capabilities found in our popular PC' versions, proten by thousands of designers around the world.

the world.

With user-definable Metric and Imperial snap grids. All dimensions are displayed in the selected measurement system. System resolution is I mil (00) inch or 025 mm). Includes support for all Maccompatible devices including high nesolution imagesetters, pen plotters, Gerberbokoepioters and NC drill file.

30 day money-back guarantee.

Easytrux 5395.00

Stand-alone PCB layout system for through-bole designs, with pad-to-pad autorouter. Includes component library.

Autotrax 5995.00

Netlist import from DesignWork's and

Autotrax" 5995.00
Nellist import from DesignWork* and
other schemitic capture packages. Auto
component loading, pad-to-pad autorouter and design rule checking. Full
SMDsupport. User-definable tracks, pads,
vias, etc. Global editing.
Autotrax Extended 5195.00
All standard version features, plus full
auto component placement and autorouting capabilities.





Protel Technology Inc. 50 Airport Parkway San Jose CA 95110 Call forFREE demog (800) 544-4186

CIRCLE 592 ON READER SERVICE CARD



Entertainment

Fonts

Genealogy

REUNION

Reunion quickly records, links, and displays family information and images. Create large,

graphic charts, family group records, family his-tories, indexes, mailing lists, birthday calendars, questionnaires, criteria reports and more.

333 1 MacUser Oct '90

Graphics



DesktopVideo Productions 1000 Broadway, Suite292 Oakland, CA 94607 415/763-6243 415/465-7458 Fax



CIRCLE 485 ON READER SERVICE CARD



sounds of real birds that sing in the background. These professionally digitized birdsongs are played at random or by menu selection, and do not interfere with the foreground application. Forty songs are included in this two-disk set. A hard disk drive is required.

Dial 505-897-4024 Visa-MC

Corrales Software

POB 2730 Corrales NM 87048

CIRCLE 434 ON READER SERVICE CARD

FREE 30 BESTSELLING FONTS

TRY US! Get 30 of our best selling laser fonts for the Macintosh® - FREE! Pay only \$5.00 for shipping Credit Cards only!

SATISFACTION GUARANTEED

SMC SOFTWARE PUBLISHERS 619 931-8111

CIRCLE 571 ON READER SERVICE CARD

Call, write, or FAX for brochure & sample printouts LEISTER PRODUCTIONS

4 File Calt Font Style Size

Descendant Chart B

Seth Alan Smith, Sr. (1915-1987) & Irene Lynn Meyterry (1912-)

Family RootsTM

Do it YOUR way! Huge variety and capacity for your family history. Make pedigree charts, descendants charts, person sheets, group sheets, indices and much more. Customize to your own preferences. Standard Mac interface Call for FREE information. Satisfaction guaranteed MC/Visa/AE. Quincept Box 216 Lexington MA 02173

14 Hill Blvd., Mechanicsburg, PA 17055 717-697-1378 — FAX 717-697-4373

Family Heritage File™

617/641-2930, 800/637-ROOT

Most powerful and easy genealogy program on Mac. Rated "BEST" by Macworld. Designed by genealogy professionals

· Enhanced · Fully relational · Graphic Pedigree, Family Group, Individual, Marriage, Surname · Unlimited History

· Sorted Lists · Export to WP/data base/modem. New Jewish version. \$149 + \$5 s/h. Demo \$7. Visa/MC. Free Lit Pak.

Star-Com Microsystems Windsor Park East 25 West 1480 North Orem, UT 84057 801/225-1480

EPS DRAWINGS

DESIGNED FOR NEWSLETTERS AND GENERAL ADVERTISING

2-Disc



VISA.

SEND CHECK OR MONEY ORDER **TS GRAPHICS**

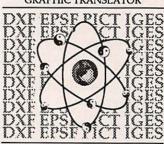
108 Shrewsbury Ave., Dept. W, Red Bank, NJ 07701 Visa-Mastercard Call 908-530-5959

CIRCLE 582 ON READER SERVICE CARD

Graphics Translators

CADMOVER®

REAL WORLD GRAPHIC TRANSLATOR



Kandu Software Corp. 703-532-0213

CIRCLE 549 ON READER SERVICE CARD

For the Businessman on the "Go"!

"Learning to play Go well is tantamount to a senior-level course in strategic thinking." United Feature Syndicate 12/12/90

'[Go Junior] Best introduction to Go yet developed." MacWorld 2/91 (800) TOYOGO-9

Toyogo, Inc. P. O. Box 25460-C, Honolulu, HI 96825-0460

808) 396-4126 fax \$35 Go Junior \$69 Go Master \$139 Deluxe Toolkit + \$6.50 S&H

CIRCLE 440 ON READER SERVICE CARD

The Macworld Catalog **DELIVERS!**

Mail order can save you timeand money!



HyperCard Stacks

Golf & Tennis Software Before you touch another club or racket use Golf Teacher and Tennis Teacher! Will benefit both the novice & the experienced player. \$34.95 each (both \$54.95). Requires Hypercard & 1mB RAM. Hard drive recommended. Golf Art & Tennis Art - clip art in HyperCard and MacPaint formats. \$24.95 each (both \$44.95) Send check, MO or school PO to: FYI Publishing PO Box 150661, Dept 1323 Fort Worth, TX 76108

817/599-3362

HyperCard Stacks

Stack Enhancers TM

Enrich HyperCared 2.0's interactive environment and the visual impact of your stacks. Simplify stack development with the Browser Palette, Object Slider and Script Viewer. Add compelling features like the Bookmark System, Search Palette and Animated Text.

- · Ten ready-to-use enhancements.
- · Simple point and click installation.
- NO SCRIPTING REQUIRED! Just \$69 + \$5 s/h. Visa/MC/Check Cheshire Grin Productions Ltd. 2145 Sherobee Rd., Suite 43 Mississauga, Ont. Canada L5A 3G8 416/896-8077, Fax 416/896-0281

Languages

MACTRAN PLUS Ver. 4.0

Integrated Made-for-Mac Development System. Includes: Editor, Optimizing Compiler, Source level Debugger, Linker, Library Manager, Profiler and Build facility. Supports 68020/030 & 68881/2 native code. Significant Vax Fortran & ANSI 8x extensions. High & Low level tool box interface. Unlimited code segment size. DCM Data Products.

610 One Tandy Center Fort Worth, TX 76102 817/870-2202 Fax 817/336-2416

Medical

MacAnatomy™/MacSurgery™ ...an electronic atlas of Anatomy in 4 vol. on disk in MacPaint™ format. Easily altered & copied to any program via the clipboard. Ideal for students of Anatomy in all the health & legal professions.

...is a HyperCardTM stack with multiple-choice questions & answers, Detailed discussions & documentations are provided. Ideal for continuing education & board preparation. MacMedic Publications 5805 Westbeimer Houston, TX 77057 713/977-2655 800/477-0717 Fax: 713/784-3759

Expand your vocabulary in: CZECH FRENCH SPANISH GERMAN RUSSIAN LATIN

Over 2000 words/1000 foreign synonyms. Complete, accurate translations and thousands of English synonyms! MacFlash Cards get you to the intermediate vocabulary level FAST. Compare our prices and SAVE! German I/II, French I/II, Spanish I/II, Russian I/II, Czech I, Latin I: \$25 each. S&H S4.50, CAL Res add 7% tax. Call or send for additional information. Order today. Call 800-622-3574,(415) 949-2876

The Language Quest Software Company 01 First Street, Suite 428, Los Altos, CA 94022 Same Day Shipping

CIRCLE 451 ON READER SERVICE CARD

FORTRAN Power on Your Desktop

- ANSI/ISO standard FORTRAN 77
- full integration with System 7.0 (including AppleEvents!)
 validated by the Federal Government
- reliable, high precision computations
- cross-linking with C and Pascal
- VAX-compatible extensions
- · automatic background execution · runs of any Macintosh with 2MB and a hard drive

Language Systems Corp. 441 Carlisle Dr. Herndon, VA 22070 703/478-0181 & 703/689-9593 (fax)

CIRCLE 594 ON READER SERVICE CARD

Dental Office Mgmt.

ToothPics® software for dental charting, walk-out statements, insurance claims, and billing. Our charting-only package, at only \$1295 will increase your revenue immediately with multicolor walk-out statements! Charting with basic billing starts at \$1995 and will outperform ANY OTHER DENTAL SOFTWARE on the market! Expandable billing features available to accommodate your growing needs. Call for product literature and DEMO software today!

DENTALK 8335 Allison Pointe Trail, Suite 310 Indianapolis, IN 46250 317-579-5900

HyperCard 2 in a Hurry! by George Beekman

Learn HyperCard 2 in just hours with this non-technical introduction for beginners! You'll work with and customize existing HyperCard stacks. Then learn techniques and tricks for building your own stacks to perform a variety of tasks.

- Six easy, hands-on sessions
 Covers all advanced features of HyperCard 2
 Includes Troubleshooting Guide, HyperTalk-dictionary, annotated Resource List

Only \$20.25!

To order, call 1-800-245-0170 Wadsworth Publishing Company 10 Davis Drive • Belmont, CA 94002 HyperCard and HyperTalk are registered trademarks of Apple Inc.
Price subject to change without notice.

"I saw it in Macworld!"

Import/Export

SPECIALISTS IN MAC. SOFTWARE & HARDWARE

Reliable

Fast and Professional Service **EMC/Agent/Representative Service**

TEL:(415) 512-7790 FAX:(415)512-9345

CIRCLE 540 ON READER SERVICE CARD

Medical

Care Tracker™

-CLINICAL CARE SUPPORT SYS-

\$489 comprehensive Mac® program featuring a robust patient care database, powerful searches and reports, A.I. for screening/risk status and drug interactions. Flow sheets, problem lists, decision analysis, remote modem access, literature management, and MUCH more. Elegant interface, ideal for practice or academia. Med4th Systems 716 East Carlisle Avenue Milwaukee, WI 53217

(414) 963-1985 Voice/Fax

Medical Office Mgmt.

TessSystem™ software for insurance and billing. Our \$1295 package outperforms software selling at three times that price. Expandable line to grow with your needs. Call for product literature and DEMO software today! New modules include electronic claims and multi-user for Mac networks. Wabash Medical Resources, Inc. 8335 Allison Pointe Trail, Suite 300 Indianapolis, IN 46250 317-579-5900



Music/MIDI

VERSION 2.2

Trainin

Musić 4

Theor

and

Teaches intervals, chords, melody, rhythm

Interactive staff notation . Saves scor

High quality sound *MIDI compatible
 Historical & computer-generated melodies
 Custom ear training melodies

*Includes textbook *Beginners to advanced

\$125.00 • Call Toll Free 800-445-4866

ARS NOVA BOX 637, KIRKLAND, WA 98083

CIRCLE 489 ON READER SERVICE CARD

Nutrition

Programming Tools

Property Management

Use MacDINE II to improve your eating

Take the guesswork out of nutrition!

- Control your weight and fat intake Fast and easy food entry Monitor your diet, meals and snacks
- Analyze and save favorite recipes 5656 expandable food database



DINE Systems, Inc. 586 N.French Rd. Ste. 2 Amherst, NY 14228 (716) 688-2492 (716) 688-2505 FAX

CIRCLE 405 ON READER SERVICE CARD

NEW!! 68000, COP800, PIC16Cxx versions!

MASMIM

Cross Assemblers for the Macintosh™

TEXT EDITOR, CROSS MACRO ASSEMBLER, AND COMMUNICATIONS FACILITY IN A COMPLETE INTEGRATED DEVELOPMENT ENVIRONMENT S OR HEX FILE OUTPUT DOWNLOADS TO MOST EPROM PROGRAMMERS \$14

\$149.95 ea

AVAILABLE FOR MOST 8-BIT MICROPROCESSORS AND 68000/010. CALL OR WRITE FOR TECHNICAL BULLETIN. 30 DAY MONEY BACK GUARANTEE. MC/V/AE.

Micro Dialects, Inc
DEPT. MW, PO BOX 30014
CINCINNATI, OH 45230 (513) 271-9100

Property Management

Comprehensive software for managing residential, commercial properties and condo associations. Includes check writing, recurring expenses, financial statements, complete management reporting and a full general ledger for \$1,195.

Yardi Systems, Inc. 813 Reddick St. Santa Barbara, CA 93103 805/966-3666

CIRCLE 416 ON READER SERVICE CARD

Macworld delivers the largest Macintosh audience!

FORTRAN Tools for AppMaker

automatically generates source code in Language Systems FORTRAN. AppMaker, from Bowers Development, is a software tool for creating Macintosh applications quickly, directly and consistently with a minimum of programing. FORTRAN Tools for AppMaker is the first product that provides this technology for FORTRAN. Language Systems Corp. 441 Carlisle Drive

Herndon, VA 22070 703/478-0181 |fax 703/689-9593

Public Domain



SOFTSHOPPE, INC.

ASP Member

- Selected Programs
- Latest Versions
- As Low as \$2.50

FREE CATALOG MAC PD/SHAREWARE

POB 3678, Ann Arbor, MI 48106

Call 800-829-BEST (2378) or 313-761-7638 Fax 313-761-7639

CIRCLE 429 ON READER SERVICE CARD

CALL NOW!...Special Pricing on Digidesign, Coda, Dr.T's, Mark of the Unicorn, Opcode, Passport, Roland Instruments, & more... FREE CATALOG! 1-800-MAC-BEAT 1-505-988-1710

CIRCLE 433 ON READER SERVICE CARD

Property Management

real estate software

■ Property Manager

Accounting system for multiple properties. Ideal for investors who manage their own properties.

ProAnalysis ***

A sophisticated investment analysis program designed for the investor who demands professional quality analysis

DEMOS NOW AVAILABLE!

Metropolis Software

\$495/\$995

CIRCLE 415 ON READER SERVICE CARD

FREE - 6 FULL 3.5" DISKS OF OUR BESTSELLERS

TRY US! Get our best selling NO VIRUS software Games•Utilities•Education Desktop Publishing - FREE Credit Cards only!

PAY ONLY \$5.00 SHIPPING

SMC SOFTWARE PUBLISHERS 619 931-8111

CIRCLE 486 ON READER SERVICE CARD

Computers



Confused about MIDI and music software? We aren't.

800-767-6161

647 Mission St. SAN FRANCISCO, CA

Composition

Educational

Multimedia

Sequencing

Free Catalog

Fst 1982

Sampling

Notation

CIRCLE 553 ON READER SERVICE CARD



Real Estate

Mac Landlord \$399

Easiest-to-use property management software for all types of properties. Designed by property managers. Includes recurring income and expenses, maintenance records, check writing, account balancing, and printing tenant notices. For single or multiple properties. Three levels of passwords. Full menu of management reports. Demo \$25 credited to purchase. Labana Management Company P.O. Box 2037

Scientific

Geological Software

Great graphics, low prices! · Lithologic log plotting · Gridding · Contouring ·Piper/Stiff plots ·Oil & Gas economics ·Stereonet plots ·Plate tectonics ·Geophysical modeling, +much more for the Macintosh & PC \$50-\$1500. Call or write for FREE catalog of easy-touse software products. RockWare Inc.

4251 Kipling, Suite 595 Wheat Ridge, CO 80033 303/ 423-5645 303/ 423-6171 FAX

Training



BASICS 1 & 2 NEW 408.358.7793

CIRCLE 514 ON READER SERVICE CARD

Computer Repair

!!REPAIR BY MAIL

Real low cost, super fast turn-around. Mac Plus, SE logic board swap \$225 + s/h; 1 yr. warranty. Plus and SE power supply swap as low as \$100 + s/h; 1 yr. warranty. Drive repairs as low as \$35. Keyboard repairs as low as \$12.50 + s/h. New and used hardware for sale. School orders welcome. Open 12 noon-10 pm eastern. We buy dead Apples, Macs, PCs.

Arminius Pubs. & Prods. Inc. P.O. Box 1265/8519 Orchard Ave. Merchantville, NJ 08109 609/662-3420

Sales/Marketing

Dearborn, MI 48123

(313) 562-6247

Market Master for the Mac Leads never "fall through the cracks" with Market Master. It doesn't just track leads, it HANDLES them! Automates follow-up for one rep or a whole sales force! Tabulates results by sales rep, lead sources, product line etc. NEW Version 3 now shipping. 30-day money-back guarantee. Demo Disk \$10.00 Call today! Breakthrough Productions, 210 Park Ave.

Sign Making

Make Vinyl Signs With Your **MAC** Software

ECCOsigns Software takes MAC created drawing files and drives any plotters/cutters.

Call ABC TECHSYSTEMS 1•800•488•2369

CIRCLE 556 ON READER SERVICE CARD

Services

Computer Insurance



INSURES YOUR

COMPLITERS

Full replacement of hardware, media, purchased software. As low as \$49 yearly. Covers fire, theft, power surges, other accidents. Blanket coverage; no list of equipment needed. Call for information or immediate coverage.

1-800-848-3469 Local (614) 262-0559

SAFEWARE, The Insurance Agency Inc. 2929 N. High Street, P.O. Box 02211 Columbus, OH 43202

CIRCLE 522 ON READER SERVICE CARD

BROKEN MACINTOSH?

LET US FIX IT FOR YOU!

- Analog Board Repair & Upgrade
- Logic Board Repair & Upgrade
- Lifetime Warranty (most repairs)
- Most Repairs in 24 Hours Parts Available

Dealer Inquiries Invited

CALL US TODAY!

Orders Other Inquiries

(800)395-9322 (206) 348-9322

CIRCLE 557 ON READER SERVICE CARD

Statistics

Sales Sales Sales! Contact Ease® is the easiest yet most

Nevada City, CA 95959

916/265-0911

powerful sales and marketing software. More than just a mailing list and phone dialer-Contact Ease turns your Mac into a marketing animal! Its aggressive automatic follow-up gives you the power to double or triple sales, just as it has for other users. Order Contact Ease now, it will make your sales and business grow! \$395, 60-day MBG. FREE demo disk.

WestWare, Inc. 10148 Diamond Head Court Spring Valley, CA 91977-5317 800/869-0871, 619/660-0356

Power Designed To Fit Your Needs

MINITAB offers a broad range of statistical functions, quick and efficient menu interface, and command option.

- Basic & Advanced DOE Statistics
 - Data Editor
- Control Charts for SPC
- Hi-Res Graphics Mac models except 128k,

CALL 800-448-3555

MINITAB

Minitab Inc., 3081 Enterprise Drive State College, PA 16801-3008 USA

CIRCLE 450 ON READER SERVICE CARD

ComputerInsurance

- ♣ Replacement with no depreciation
- + Covers computer hardware in home or office
- + Easy to read policy
- ♣ Bonus 20% for software coverage
- **★** Low \$50 deductible
- + Covers theft, fire, power surges, accidents, natural disasters, even earthquakes and flood
- Policy backed by an A+ company

ECOMPUTERINSURANCE 6150 Old Millersport Road, NE

Pleasantville, OH 43148

1-800-722-0385

CIRCLE 523 ON READER SERVICE CARD

MAC REPAIR

Mac Shop Northwest

- Apple™ Certified Technicians
- One-Day Service Turnaround*
- Hard Disk Repair & Data Recovery
- Up to 75% below Dealer Rates
- Component-Level Repairs
- Expert Advice and Prices by Phone
- Power Supplies & Logic Boards
- Lifetime Repair Warranty*

on many repairs. Visa/MC/AX. Fast overnight shipping Fed Ex available. We use genuine Apple™ parts.

1-800-MAC-SHOP

CIRCLE 515 ON READER SERVICE CARD



\blacksquare The Macworld Catalog \blacksquare

Data Conversion

TAPE/DISK **CONVERSIONS**

Conversion services to or from over 3000 computer systems:

 Word Processors CALL THE INDUSTRY LEADERS

PIVAR COMPUTING SERVICES, inc.

800-CONVERT

708/459-6010 165 Arlington Heights Rd #MC Buffalo Grove, IL 60089

Data Recovery

Data Recovery

Your data is important. Let the company that specializes in Data Recovery & Hard Drive Repair, provide you with expert service. Computer Peripheral Repair has been recognized in several national magazine articles for its data recovery techniques and the ability to repair SCSI drives for both Mac and PC environments.

Computer Peripheral Repair 7570 South U.S. Hwy.1, Suite 8 Hlypoluxo, FL 33462 407/586-0011 800/765-9292

Accessories

Diskettes

FORMATTED DISKETTES BASF, VERBATIM, SONY

WITH	QTY 250	WITHOUT
FORMAT	MIX & MATCH	FORMAT
\$.44	5.25' DS/DD	\$.39
\$.69	5.25° DS/HD	\$.59
\$.65	3.50° DS/DD	\$.56
\$1.19	3.50° DS/HD	\$1.09

- FREE FORMATTING on First Order
 TYVEC SLEEVES & Labels Included
 COLORED MEDIA Please Add \$.05
 PRIVATE LABELING Available
 SAME DAY Shipping
 MONEY BACK GUARANTEE

800-255-3142

Diversified Systems Group, Inc. PO Box 1114, Issaquah WA 98027

CIRCLE 496 ON READER SERVICE CARD

Data Recovery

MACWORLD 1.75 X 4

WE CAN SAVE IT!

QIVESAL

* Macintosh Data Recovery

* Mac Back-up Solutions

* Competitive Pricing * Fast Nationwide Service

* Repair any Mac Hard Drive

* 24-hour Service Available

DRIVESAVERS

30 Pamaron Way, Suite D

Novato, CA 94949

PHONE: 415/883-4232

FAX: 415/883-0780

CompuServe: 76117,3055

CIRCLE 510 ON READER SERVICE CARD

Desktop Publishing

400 dpi continuous tone COLOR

prints via Postscript® compatible Canon Color Laser Copier. More software supported!!!

Elegant (707) 795-3272

CIRCLE 527 ON READER SERVICE CARD

Furniture



Nationally advertised fine oak furniture

Save upto 40% factory direct!

PRINTER STANDS

AND MORE. Call Now For Free Catalog

1-800-333-8095 The Walker Company Petaluma, CA CIRCLE 543 ON READER SERVICE CARD

Laser Recharge

cartridges! "\$**44**95 We buy empties oducts Corp. re, Pgh, PA 15234 call for brochure 800-426-8196

CIRCLE 445 ON READER SERVICE CARD

Did you know that:

- Over one-third of all Macworld subscribers do not read any other Macintoshspecific publication?
- The average Macworld subscriber has used a personal computer for almost 6 years?
- Macworld subscribers hold high level positions in their organizations and more than 80% are active participants in the purchase of computers and third-party products?
- Macworld subscribers give purchase advise to an average of 18 people per month?

Source: 1990 Macworld Subscriber Study



Furniture



- Space Saving
- Strong
- Many Configurations



agio UDS BOSTON, ORIGON

CIRCLE 402 ON READER SERVICE CARD

Mouse Pads

Your Logo Specialist Qty. (Lexan-hard surface)

\$6.45 wo/logo N/A

36 \$5.95 wo/logo N/A

7 2 \$5.70 wo/logo \$6.50 w/logo 144 \$5.15 wo/logo \$5.20 w/logo

500 \$4.80 wo/logo \$4.60 w/logo 1000 \$4.48 wo/logo \$4.48 w/logo

Choose your color. Size 8 1/2 x 11 Ask for samples. We specialize in private label. Great promo item. Satisfaction Guaranteed Innovative Technologies

619/456-0722 Fax 619/456-2732 800/522-5654 (CA)

800/544-5654 (USA)

Supplies



CIRCLE 477 ON READER SERVICE CARD

Macworld

#1 in bringing buyers and sellers together!

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.

Supplies

Mouse Pads

Custom Printing/Picture Pads Available.

Cloth: 13 Colors

8x71/4 8x91/2 81/2x11 Size: 12 Pads 3.25 3.50 3.75 3.00 3.50 3.25 3.00 144 2.85 3.25 PLASTIC: Blue, Platinum, Grav, Red &

Black, Size: 81/2x11

12 Pads 5.75

SEE OUR WRIST RESCUE AD -

THIS PAGE Precision Line Inc. 14505 21st Ave. No. Ste. 206

Plymouth, MN 55447 612/475-3550, 1/800/328-0077







Wrist Rescue supports your hands and wrists while typing to help reduce stress on joints and tendons. Height adjustable for different keyboards. Constructed of soft cloth laminated foam with a solid maple base. Price: \$18.95-includes shipping and handling,

(800) 328-0077 (800) 328-0077 14505 21st Ave. N. #206 FAX: (612) 475-3577 Minneapolis, MN 55447

Precision Line Inc.

CIRCLE 406 ON READER SERVICE CARD

Continued...



Supplies

Supplies

Cordura exterior for durability. Thick, high-density foam padding for shock absorption. Padded pockets to protect keyboard, peri-

pherals and drive. Color choices.

MacIlex, ci. MacPortable



401-274-0595

A Division of Karen Anne Mfg. Fall River, MA

CIRCLE 423 ON READER SERVICE CARD

Pack vour

in seconds!

Holds LC or SI with 12" monitor,

keyboard, mouse and cables.

WEST RIDGE DESIGNS

For a dealer near you call toll free

1-800-548-0053

1236 N.W. Flanders, Portland, OR 97209

CIRCLE 444 ON READER SERVICE CARD

Mac Plus.SE and others

800-343-3388

CIRCLE 403 ON READER SERVICE CARD



The Best Case Scenario

Airline Check-in or Local Use

Zero Halliburton Aluminum Mac Cases:

Lightweight, Durable, Distinctive Styling CLASSIC/Plus/SE Ilcx/ci Ilsi LC Ilx/fx

Portable Attaches Monitor & Printer Cases

from \$299.95 1-800-542-4591

TCC 13101 Wash, Blvd., #110, L.A. CA 90066

1-213-578-9710

CIRCLE 507 ON READER SERVICE CARD



ANTI STATIC PADS \$8 WRIST PROTECTORS \$6 **MACINTOSH SOFTWARE** DEALER PRICING AVAILABLE CS PRODUCTS (215) 288-9848

Discount Ribbons

CIRCLE 591 ON READER SERVICE CARD

COVERS ALL FABRIC Heat Ventilating, will not become stiff or crack with age! * Easy to Use. * Auchine Wash & Dryl Highest Quality, Custom-Fit I All makes & models! * Custom-orders! * Available in Gray, Tan, Navy, Royal, Red or Brown. 100% Satisfaction Guaranteed! Oustanding service since 1983!



Supplies

CO-DU-CO Computer Dust Covers 4802 W. Wisconsin Ave., Milwaukee, WI 53208 800-735-1584 111-176-1581 - 176-9329FA

CIRCLE 455 ON READER SERVICE CARD

Wherever the

market goes,

Macworld is

there first!



CIRCLE 565 ON READER SERVICE CARD

Miscellaneous Clothing



CIRCLE 585 ON READER SERVICE CARD

LOWEST PRICES HERE

PRODUCT LAUNCH

SECTION

MACWORLD

Turn to the Product Launch Section of Macworld for information on the new products in the Macintosh industry.

This is the premiere showcase for new product launchs or relaunchs. Look to the Macworld Product Launch section—your source for the newest Macintosh products.

Call your account executive for more details on advertising in the Macworld Product Launch section! (415) 243-0505



PostScript® Language Interpreter and Utilities



- · Outputs PostScript®documents to Apple (incl. StyleWriter, Laser LS), HP, GCC, Canon, Epson, Mitsubishi and others
- · PostScript®to TIFF converter with variable resolution up to 2000 dpi color
- · Supports all PostScript®fonts
- · Previews PostScript®files
- · Chooser level & AppleTalk compatible
- · System 7.0 and TrueType compatible
- T-Script \$145, Basic \$85, Deluxe \$495



The smooth performer



TeleTypesetting

TScript(®) is a registered trademark of TeleTypesetting Co., PostScript, is a registered trademark of Adobe Systems Incorp

Circle 11 on reader service card.



Microtek 600 ZS \$1399

SYSTEMS	
Mac LC 2/40	1720
Mac Classic	830
Mac Classic 2/40	1295
Mac IIfx	4890
Mac Ilci	3450
Mac Ilsi	2625
Mac Portable 2/40	2650
Mac Portable 4/40	2880

MONITORS

MOMITORS	
E-Machine	
E-Machine T19	3580
E-Machine TI6	1975
E-Machine TI6/XL24	2750
E-Machine TX	2600
IKegami	
IKegami CT20 Color Trinitron	
	45/825
Radius	
19" Color Display	2950
21" Color Display	3125
Pivot	699
Color Pivot	1385
Color Pivot Interface	540
II, LC, IIsi, SE, SE/30	
Full Page System for Classic	825
Full Page System for LC	885
Full Page System for SE	825
Pivot Display for Built-in Video	766
Precision Color Calib.	473
Quick Color Graphics Engine	268
Two Page Display 19"	959
Two Page Display 21"	1230
Two Page Display Interface SE, SE/30, II, IIsi	399
Seiko	
Seiko CM-1445	539

SuperMac	
Platinum 19" Display	964
Platinum Two-Page Display	1239
Super Match 19" Color	1929
Super Match 21"	
Two-Page Color Display	3031
Trinitron 16" Display	1860
Color Card/24	482
Dual-Mode Trinitron 19"	2893
Graphics Accelerator	275
Monochrome Card	344

DRIVES

	Ext.	Interna
Quantum 52LPS,		
1" 17msec	356	259
Quantum 105 Pro	469	389
Quantum 170 Pro	735	695
Quantum 210 Pro	835	710

PRINTERS

TI Microlaser PS35	1519
TI Microlaser PS17	1219
HP Deskwriter	489
QMS PS410	1860
Qume Crystal Print	2119
Publisher II	
Crystal Print Mac Publisher	1688

SCANNERS

Logitech ScanMan 32	279
Microtek 600ZS w/Photoshop	1399
Microtek 300ZS w/Photoshop	1689
Caere Typist	420

MODEMS

Zoom	
FX9624 Plus 2400 BPS	139
ModemMX 2400S w/SendFax	
9600 BPS	105
v.32 Turbo w/v.42bis	
w/MNP software	445



Printer Connection

(714) 758-8832 FAX (714) 635-1752 Circle 202 on reader service card.



Four highly reliable uses for your not-by-CORE Macintosh drive.









For reliability with your Mac, call us.

Tired of finding alternative uses for your "Click & Pray" drives? CORE hard drives are built for one purpose only. Our strict standards of quality bring you the performance you demand — and reliability you can count on.

So, after years of leading the PC users of the world to high reliability, high performance,

and high capacity, we're now inviting the Macintosh user to enjoy these same standards.

Accompanying these standards are two and five year full replacement warranties, backing drives with MTBF ratings of 150,000 hours and seek times better than 14ms.

If the notion of 80,120 & 200 MB CORE Optima SeriesTM drives in a small foot print external cabinet sounds appealing, or if HC
Mac Series in 330, 650, 1000 &

1300MB capacities fits the bill, call us today.

COREwest 213/595-8966 • COREcentral 708/439-0511 • Federal Sales 301/258-8818 CORE International (U.K.) Ltd. 0344 861776 • Headquarters & International Sales 407/997-6055 • Fax 407/997-6009

Ingram Micro D 800/456-8000 • Merisel 800/637-4735(US) 416/-738-3920 (Canada)

CORE International, CORE, Optima, & HC Mac Series are trademarks of CORE International, Inc. Other trademarks referenced are the property of their owners. Copyright 1991 CORE International Inc.



Automatic Network Backup!

MicroNet makes automatic backups of entire Macintosh networks easy. Because now we're offering a version of Retrospect Remote software free, with the purchase of one of our streaming tape or DAT backup systems. Capacities range from 150 MBytes to 5.0 GBytes.

Retrospect Remote is also included free with specific models of MicroNet SyQuest removable cartridge drives and our rewritable optical systems. These high speed backup systems are excellent for backing up a single workstation or for automatic and unattended backup of multiple workgroups.

Retrospect Remote is also included free with specific models of MicroNet SyQuest removable cartridge drives and our rewritable optical systems. These restor for backing up a single workstation or for automatic and unattended backup of resellent for backing up a single workstation or for automatic and unattended backup of resellent for backing up a single workstation or for automatic and unattended backup of resellent for backing up a single workstation or for automatic and unattended backup of resellent for backing up a single workstation or for automatic and unattended backup of resellent for backing up a single workstation or for automatic and unattended backup of resellent for backing up a single workstation or for automatic and unattended backup of resellent for backing up a single workstation or for automatic and unattended backup of resellent for backing up a single workstation or for automatic and unattended backup of resellent for backing up a single workstation or for automatic and unattended backup of the single workstation or for automatic and unattended backup of the single workstation or for automatic and unattended backup of the single workstation or for automatic and unattended backup of the single workstation or for automatic and unattended backup of the single workstation or for automatic and unattended backup of the single workstation or for automatic and unattended backup of the single workstation or for automatic and unattended backup of the single workstation or for automatic and unattended backup of the single workstation or for automatic and unattended backup of the single workstation or for automatic and unattended backup or for automatic and unattended backup or for automatic and unattended backup or f

Our backup system can be set to go from Macintosh to Macintosh, performing local and file server backups across the entire network. MicroNet systems are compatible with LocalTalk, EtherTalk, TokenTalk,

> and PhoneNet. Retrospect Remote software provides enhanced backup and restore capabilities, archiving, data compression, data verification and data encryption. Passwords and user privileges are maintained

with each backup which makes restoration of a file server fast and easy.

For additional information or name of a reseller near you, call 1-714-837-6033 today. Proudly distributed by Ingram Micro.

Quality You Can Count On!

Retrospect Remote is a trademark of Dantz Development Corp NuPORT is a trademark of MicroNet Technology, Inc. Macintosh is a trademark of Apple Computer, Inc.



MicroNet Technology, Inc.

20 MASON • IRVINE, CALIFORNIA • TEL: (714) 837-6033 • FAX: (714) 837-1164 AppleLink: D1656 • Compuserve: 76004,1611

Circle 113 on reader service card

BEST-SELLERS

Months on chart	Last month	This month	
~	V	V	BUSINESS SOFTWARE
			DUSINESS SUFTWARE
77		1	Microsoft Word Microsoft Corporation
68	2	2	Microsoft Excel Microsoft Corporation
29 56	5	3	FileMaker Pro Claris Corporation
64	4	5	Microsoft Works Microsoft Corporation Aldus PageMaker Aldus Corporation
29	8	6	WordPerfect WordPerfect Corporation
53	6	7	MacWrite II Claris Corporation
30	7	8	QuarkXPress Quark
16	10	9	Quicken Intuit
22	1=	10	Adobe Illustrator Adobe Systems
2	3		EDUCATION SOFTWARE
18	5	1 2	Kid Pix Brøderbund Software Where in the USA Is Carmen Sandiego?
Here is			Brøderbund Software
44	4	3	Reader Rabbit The Learning Company
56		4	Math Blaster Davidson & Associates
31	2	5	Where in the World Is Carmen Sandiego?
			Brøderbund Software
			ENTERTAINMENT SOFTWARE
22	2	1	SimCity Maxis
20	1	2	Tetris Spectrum HoloByte
7	3	3	SimEarth Maxis
1 -	5	4	RoboSport Maxis
14	5	5	Welltris Spectrum HoloByte
10			NETWORK/DATA COMMUNICATIONS White Knight FreeSoft
51	2	2	AppleShare Apple Computer
56	1	3	TOPS Sitka Corporation
1	-	4	DataClub International Business Software
14	5	5	MicroPhone II Software Ventures

Months on chart	Last month	This month	
Y	Y		MASS STORAGE*
19		1	MacStack SD40 CMS Enhancements
3		2	Infinity 40 Turbo (Removable) PLI
5		3	Platinum Pl 40 (Internal) CMS Enhancements
1		4	UltraDrive 80 GCC Technologies
8	3	5	UltraDrive 45 GCC Technologies
12 1 6 1 13	2 	1 2 3 4 5	ADD-IN BOARDS Pivot Radius FastCache Ilci DayStar Digital Macintosh Ilsi NuBus Adapter Card Apple Compute Apple Ile Card for Macintosh LC Apple Computer Radius TPD Interface Radius
			UTILITY SOFTWARE
18	1	1	SAM II Symantec Corporation
12	2	2	The Norton Utilities for the Macintosh Symantec
			Corporation
18	3	3	SUM II Symantec Corporation
5	4	4	After Dark Berkeley Systems
5	5	5	Pyro Fifth Generation Systems

PRODUCT WATCH

Recent or forthcoming products of particular interest.

Fair Witness Chena Software
Electronic blackboard for data and work management

QuickTime Apple Computer

System software addition for including video, sound, and animation in applications

ColorStudio 1.5 Letraset

Color-manipulation program now includes ColorTalk language for programmable effects

Source: Exclusive InfoCorp survey of more than 125 Macintosh retailers and selected mail-order vendors. Covers sales during June 1991.

^{*}Does not include hard drives installed at the factory.

There Are Very Few Things As Trustworthy...



pherals From Mirror.

ProView 20" Trinitron® color systems are half the price of Radius yet rated higher in MacUsers' Color Buyers' Guide (4.5 mice rating). Our PixelView full page and two page monochrome models are available for all Macs including the Plus and Classic.

And now, Mirror has a new troop of Mac peripherals including compact portable drives, a 14" Color Monitor for the LC, SI and CI and the Mirror 600 Color Scanner. All with the same trustworthy Mirror name.

Before you buy a Macintosh peripheral from a company that may expire before its warranty, give us a call at 1-800-654-5294.

No need to scout around anywhere else.

MIRROR

To Order Direct, Call 1-800-654-5294



FEDERAL

As Affordable Perip

Mirror has been a trusted name in Macintosh peripherals for almost as long as there has been a Mac. You see, we believe in treating customers the old fashioned way: offering a reliable product at a fair price, and backing it up with a 30-day, money-back guarantee.

The line-up begins with our dependable, hard-disk drives, designed to fit nearly every need and budget. From the affordable 40 MB drive to the versatile 45 MB removable to our

top ranked CD-ROM, you'll get the best value in the industry. And a

two-year warranty.

If you're looking for a big screen monitor, you can save literally
thousands by buying direct from Mirror. Our critically acclaimed

System 7.0	Compa	tible
Hard drives	Ext.	Int.
40MB	\$297	\$247
50MB(Q)*	\$397	\$337
80MB	\$397	\$347
105MB(Q)*	\$497	\$437
210MB(Q)*	\$897	\$847
333MB	\$1297	\$1197
425MB	\$1497	\$1397
595MB	\$1797	N/A
1 GB	\$2597	N/A
40MB Portable	\$297	N/A
80MB Portable	\$397	N/A
600MB Opt.**	\$2997	N/A
CD ROM	\$697	N/A
45MB Rem.**	\$497	N/A
88MB Rem.**	\$847	N/A

The new 14" Color Monitor for the LC,SI and CI is now available for just \$397.

Our flicker-free 15" Portrait Display allows you to view a full page. \$497



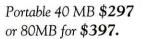


*(Q) Denotes Quantum mechanism

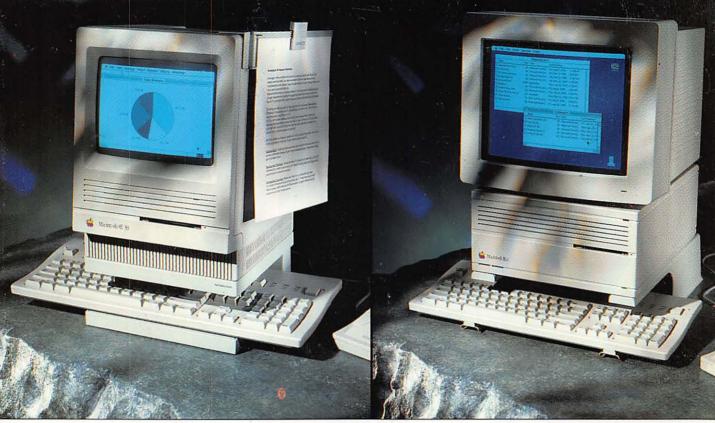




The 24 bit Mirror 600 Color Scanner comes complete with a free copy of Adobe Photoshop LE. \$1397



^{**} Price includes 1 cartridge



Keyboard Shelf and SideClip with Macintosh SE/30.

Keyboard Slideaway with Macintosh Ilci.

SPACE THAT WORKS

You're tripping over your keyboard. Your CPU needs its own desk. Your monitor is too low. That report you're working on has vanished. Paper is everywhere.

But don't give up.

What you need is some help from Kensington. Increase valuable desk space with our new Keyboard Shelf for the compact Mac, or with Keyboard Slideaway® for the Mac II.

Both do more than just get your keyboard out of the way.

Keyboard Shelf's recessed storage compartent is ideal for holding pens, disks and other desk items. And Keyboard Slideaway extends a narrow desktop into a wider workspace.



Another way to increase your workspace is our sturdy Mac II stand. The perfect addition for anyone who wants to get their CPU off their desk and onto the floor.

For the compact Mac, there's Maccessories® Tilt/Swivel. With it, you can rotate your Mac up

to 100° and tilt up to 16° for just the right viewing position. And unlike other tilt/swivels, we've combined heavy duty plastic and



high density polyethylene for an ultrasmooth movement.

What's more, Kensington's products fit right in with the design of your Mac. The styling is complementary. The colors identical. Even the same materials are used.

Kensington.

Because you can't work efficiently if your space doesn't work.

For a free brochure and the dealer nearest you, call 800-535-4242, OR 415-572-2700.

Dealers circle 256 on reader service card

End users circle 255 on reader service card

KENSINGTON.

Maccessories, Keyboard Slideaway, SideClip, and Kensington are registered trademarks of Kensington Microware Limited. Apple and Macintosh are registered trademarks of Apple Computer Inc. p. 1990 Kensington Microware Limited.